



**INDICATIVE PROJECT SUMMARIES**

**SECTION 319 NONPOINT SOURCE  
COMPETITIVE GRANTS PROGRAM**

**FFY 2001 - 2005**

**Massachusetts Department of Environmental Protection  
Bureau of Resource Protection  
Glenn Haas, Acting Assistant Commissioner**

**2005**

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**SECTION 319 NONPOINT SOURCE PROGRAM  
INDICATIVE PROJECT SUMMARIES**

**FFY 2001 – 2005**

**Prepared by:  
Jane Peirce, 319 Program Coordinator**

**Massachusetts Executive Office of Environmental Affairs  
Stephen R. Pritchard, Secretary**

**Department of Environmental Protection  
Robert W. Golledge, Jr., Commissioner**

**Bureau of Resource Protection  
Glenn Haas, Acting Assistant Commissioner**

**Division of Watershed Management  
Glenn Haas, Director**

**Division of Municipal Services  
Steven J. McCurdy, Director**

**2005**

## **NOTICE OF AVAILABILITY**

**Limited copies of this report are available at no cost by written request to:**

**Massachusetts Department of Environmental Protection  
627 Main Street, 2<sup>nd</sup> floor  
Worcester, MA 01608**

**This report is also available from DEP's home page on the World Wide Web at**

**<http://www.state.ma.us/dep/brp/wm/wmpubs.htm#nps>**

Furthermore, at the time of first printing, eight (8) copies of each report by this office are submitted to the State Library at the State House in Boston; these copies subsequently are distributed as follows:

- On shelf; retained at the State Library (two copies);
- Microfilmed; retained at the State Library;
- Delivered to the Boston Public Library at Copley Square;
- Delivered to the Worcester Public Library;
- Delivered to the Springfield Public Library;
- Delivered to the University Library at UMass, Amherst;
- Delivered to the Library of Congress in Washington, DC.

Moreover, this wide circulation is augmented by inter-library loans from the above-listed libraries. For example, a resident of Winchendon can apply at the local library for a loan of the Worcester Public Library's copy of any DEP/Division of Watershed Management report.

A complete list of reports published since 1963 is updated and printed in July. This report, entitled, "Publications of the Massachusetts Division of Watershed Management, 1963 - (current year)," is also available by writing to the DWM in Worcester. The report can also be found at DEP's web site, at <http://www.state.ma.us/dep/brp/wm/wmpubs.htm#nps> .

## TABLE OF CONTENTS

<b>Introduction .....</b>	<b>1</b>
<b>Figure 1: Massachusetts River Basins for Water Resources Planning.....</b>	<b>2</b>
<b>Table 1: Allocation of Dollars by Basin .....</b>	<b>3</b>

### **Indicative Project Summaries - FFY 2001:**

01-01/319	Lake Cochituate, Snake Brook NPS Remediation, Phase I .....	10
01-02/319	Boat Waste Oil Recovery Program for New Bedford Harbor .....	11
01-03/319	Parker Pond Restoration, Gardner .....	12
01-04/319	Massachusetts Buffer Manual and Demonstration Projects .....	13
01-05/319	Evaluation of Phosphorus Removal in Onsite Septic Systems .....	14
01-06/319	Memorial Pond Restoration, Phase I.....	15
01-07/319	Wareham NPS Remediation Program, East River, Broad Cove, Muddy Cove .....	16
01-08/319	Gray's Beach Park Restoration, Kingston .....	17
01-09/319	Nashawannuck Pond Restoration, Phase II .....	18
01-10/319	Development and Demonstration of a Lake Watershed Survey Program .....	19
01-12/319	Cranberry Bog Phosphorus Dynamics for TMDL Development .....	20

### **Indicative Project Summaries - FFY 2002:**

00-12/319	Salisbury Pond Resource Restoration .....	4
00-13/319	Implementation of Nutrient Management Standards on Massachusetts Crop/Livestock Farms to Reduce the Risk of Nonpoint Source Pollution.....	5
00-14/319	Forestry Best Management Practices (BMP) Implementation and Monitoring Protocol Project .....	6
00-15/319	Revision of the Massachusetts Nonpoint Source Management Manual.....	7
01-13/319	Lake Buel Implementation and Demonstration Project .....	21
01-14/319	Pontoosuc Lake Watershed Resource Restoration Project.....	22
01-15/319	Implementing a Stormwater Remediation Strategy at Ashmere Lake .....	23
01-16/319	Plymouth Road Stormwater Treatment System.....	24
01-17/319	North Green Stormwater Management Project .....	25
01-18/319	Lagoon Pond Runoff Renovation Project.....	26
01-19/319	Oldham and Furnace Pond Stormwater Treatment .....	27
01-20/319	Lake Attitash Stormwater Treatment Program .....	28
01-21/319	Lake Quinsigamond and Lake Ripple Restoration Project .....	29
01-22/319	Stormwater Management Plan at the Millyard Marketplace.....	30
01-23/319	Demonstration of Innovative Stormwater Management Retrofit Systems .....	31
01-24/319	Storm Water System Maintenance and Residuals Waste Handling.....	32
01-25/319	Operation and Maintenance of the Massachusetts Alternative Septic System Test Center .....	33
01-26/319	Massachusetts Estuaries Project.....	34

### **Indicative Project Summaries - FFY 2003:**

02-01/319	Indian Lake Watershed Resource Restoration.....	35
02-02/319	Wall Street Highway Yard Stormwater Improvements Project.....	36
02-03/319	Stormwater Management on the Middle Pond of the Congamond Lakes .....	37

02-04/319	NPS BMPs at Richmond Pond .....	38
02-05/319	Neponset River Watershed Bacteria TMDL Implementation Project .....	39
02-06/319	Head of Westport Stormwater Project.....	40
02-07/319	Lake Singletary Storm Drain Retrofit Program.....	41
02-08/319	Hammond Pond Stormwater Management Plan Implementation Phase I.....	42
02-09/319	Stormwater Remediation for Plymouth Harbor and Plymouth Bay .....	43
02-10/319	Implementation of TMDL Recommendations at Lake Boon .....	44
03-01/319	Operation of the Massachusetts Alternative Septic System Test Center .....	46
03-02/319	Comparison Of Virus Removal In Aggregate Free Chamber Leaching Systems vs. Aggregate Laden Trenches.....	47
03-03/319	South Coastal Inter-Municipal Water Quality Improvement Project .....	48
03-04/319	Dorothy Pond Perimeter and Local Watershed Stormwater Management/Remediation Proposal.	49

#### **Indicative Project Summaries - FFY 2004:**

00-16/319	Lake Wyola TMDL Implementation.....	8
00-17/319	Stormwater BMPs on Residential Property .....	9
02-11/319	Wachusett Mountain NPS .....	45
03-05/319	Bare Hill Pond Noxious Aquatic Plant Reduction .....	50
03-06/319	Pittsfield Water Supply Stormwater Remediation Project.....	51
03-07/319	Connecticut River Phase III.....	52
03-08/319	Powow River Stormwater Management.....	53
03-09/319	Clark and Cobb's Pond Stormwater Management .....	54
03-10/319	Spy Pond Stormwater Management .....	55
03-11/319	Billington Sea Stormwater Remediation .....	56
03-12/319	Stormwater BMPs at Peppermint Brook and Lily Pond.....	57
04-01/319	Operation and Maintenance of MASSTC .....	58
04-02/319	UMass/EOEA Innovative Stormwater Technology Transfer and Evaluation .....	59
04-03/319	LID Training and Technical Assistance for Local Decision Makers .....	60

#### **Indicative Project Summaries - FFY 2005:**

04-04/319	Upper Charles River Watershed Total Maximum Daily Load and Watershed-Based Plan .....	61
04-05/319	Phosphorus and Sediment Load Reduction at Quaboag and Quacumquasit Ponds .....	62
04-06/319	Enhancing Implementation of Nutrient Management on Massachusetts Crop/Livestock Farms to Reduce the Risk of Nonpoint Source Pollution.....	63
04-07/319	Stormwater BMP Implementation for Route 28 to Bass River Subwatershed .....	64
04-09/319	Stormwater Management Retrofits for the Samoset Street Outfall to Plymouth Harbor .....	65
04-10/319	Pontoosuc Lake Watershed Planning Program .....	66
04-11/319	Cold Spring Brook Watershed Remediation .....	67
04-12/319	Demonstration Boat Bottom Wash Water System .....	68
04-14/319	Development of Watershed-Based Plans .....	69
04-15/319	Dudley Pond Comprehensive Water Quality Improvement Project.....	70
05-01/319	Operation and Maintenance of the Massachusetts Alternative Septic System Test Center.....	71
05-03/319	Windsor Reservoir Restoration Project.....	72

#### **Indicative Summaries by Basin, FFY 2001 - 2005**

##### **Blackstone**

00-12/319	Salisbury Pond Resource Restoration.....	4
01-21/319	Lake Quinsigamond and Lake Ripple Restoration Project.....	29

02-01/319	Indian Lake Watershed Resource Restoration.....	35
02-07/319	Lake Singletary Storm Drain Retrofit Program.....	41
03-04/319	Dorothy Pond Perimeter and Local Watershed Stormwater Management/Remediation Proposal.	49

#### **Boston Harbor**

01-06/319	Memorial Pond Restoration, Phase I.....	15
01-24/319	Storm Water System Maintenance and Residuals Waste Handling .....	32
02-05/319	Neponset River Watershed Bacteria TMDL Implementation Project .....	39
03-09/319	Clark and Cobb's Pond Stormwater Management .....	54
03-10/319	Spy Pond Stormwater Management .....	55

#### **Buzzards Bay**

01-02/319	Boat Waste Oil Recovery Program for New Bedford Harbor .....	11
01-05/319	Evaluation of Phosphorus Removal in Onsite Septic Systems .....	14
01-07/319	Wareham NPS Remediation Program: East River, Broad Cove, Muddy Cove .....	16
02-06/319	Head of Westport Stormwater Project.....	40

#### **Cape Cod**

04-07/319	Stormwater BMP Implementation for Route 28 to Bass River Subwatershed .....	64
-----------	---	----

#### **Charles**

01-16/319	Plymouth Road Stormwater Treatment System.....	24
02-08/319	Hammond Pond Stormwater Management Plan Implementation Phase I .....	42
04-04/319	Upper Charles River Watershed Total Maximum Daily Load and Watershed-Based Plan .....	61
04-11/319	Cold Spring Brook Watershed Remediation .....	67

#### **Chicopee**

No projects

#### **Concord**

01-01/319	Lake Cochituate, Snake Brook NPS Remediation, Phase I .....	10
02-10/319	Implementation of TMDL Recommendations at Lake Boon .....	44
04-15/319	Dudley Pond Comprehensive Water Quality Improvement Project.....	70

#### **Connecticut**

01-09/319	Nashawannuck Pond Restoration, Phase II .....	18
00-16/319	Lake Wyola TMDL Implementation .....	8
03-07/319	Connecticut River Phase III.....	52

#### **Deerfield**

No projects

#### **Farmington**

01-04/319	Massachusetts Buffer Manual and Demonstration Projects .....	13
-----------	--	----

#### **French**

No projects

#### **Housatonic**

01-04/319	Massachusetts Buffer Manual and Demonstration Projects .....	13
-----------	--	----

01-13/319	Lake Buel Implementation and Demonstration Project.....	21
01-14/319	Pontoosuc Lake Watershed Resource Restoration Project.....	22
01-15/319	Implementing a Stormwater Remediation Strategy at Ashmere Lake.....	23
02-04/319	NPS BMPs at Richmond Pond.....	38
03-06/319	Pittsfield Water Supply Stormwater Remediation Project.....	51
04-10/319	Pontoosuc Lake Watershed Planning Program.....	66
05-03/319	Windsor Reservoir Restoration Project.....	72
<b>Ipswich</b>		
01-17/319	North Green Stormwater Management Project.....	25
<b>Islands</b>		
01-18/319	Lagoon Pond Runoff Renovation Project.....	26
<b>Hudson (Hoosic, Kinderhook, BashBish)</b>		
No projects		
<b>Merrimack</b>		
01-20/319	Lake Attitash Stormwater Treatment Program.....	28
03-08/319	Powow River Stormwater Management.....	53
<b>Millers</b>		
01-03/319	Parker Pond Restoration, Gardner.....	12
<b>Narragansett Bay/Mt. Hope</b>		
No projects		
<b>Nashua</b>		
02-11/319	Wachusett Mountain NPS.....	45
03-05/319	Bare Hill Pond Noxious Aquatic Plant Reduction.....	50
<b>North Coastal</b>		
01-23/319	Demonstration of Innovative Stormwater Management Retrofit Systems.....	31
04-12/319	Demonstration Boat Bottom Wash Water System.....	68
<b>Parker</b>		
No projects		
<b>Quinebaug</b>		
01-22/319	Stormwater Management Plan at the Millyard Marketplace.....	30
<b>Shawsheen</b>		
No projects		
<b>South Coastal</b>		
00-17/319	Stormwater BMPs on Residential Property.....	9
01-08/319	Gray's Beach Park Restoration, Kingston.....	17
01-19/319	Oldham and Furnace Pond Stormwater Treatment.....	27
02-09/319	Stormwater Remediation for Plymouth Harbor and Plymouth Bay.....	43
03-03/319	South Coastal Inter-Municipal Water Quality Improvement Project.....	48
03-11/319	Billington Sea Stormwater Remediation.....	56

03-12/319	Stormwater BMPs at Peppermint Brook and Lily Pond.....	57
04-03/319	LID Training and Technical Assistance for Local Decision Makers .....	60
04-09/319	Stormwater Management Retrofits for the Samoset Street Outfall to Plymouth Harbor .....	65

#### **Taunton**

No projects

#### **Ten Mile**

02-02/319	Wall Street Highway Yard Stormwater Improvements Project.....	36
-----------	---	----

#### **Westfield**

00-14/319	Forestry Best Management Practices (BMP) Implementation Monitoring Protocol .....	6
02-03/319	Stormwater Management on the Middle Pond of the Congamond Lakes .....	37

#### **Statewide Projects**

00-13/319	Implementation of Nutrient Management Standards on Massachusetts Crop/Livestock Farms to Reduce the Risk of Nonpoint Source Pollution .....	5
00-14/319	Forestry Best Management Practices (BMP) Implementation Monitoring Protocol.....	6
00-15/319	Revision of the Massachusetts Nonpoint Source Management Manual.....	7
01-05/319	Evaluation of Phosphorus Removal in Onsite Septic Systems .....	14
01-10/319	Development and Demonstration of a Lake Watershed Survey Program.....	19
01-12/319	Cranberry Bog Phosphorus Dynamics for TMDL Development .....	20
01-25/319	Operation and Maintenance of the Massachusetts Alternative Septic System Test Center.....	33
03-01/319	Operation of the Massachusetts Alternative Septic System Test Center .....	46
03-02/319	Comparison Of Virus Removal In Aggregate Free Chamber Leaching Systems vs. Aggregate Laden Trenches .....	47
04-01/319	Operation and Maintenance of MASSTC .....	58
04-02/319	UMass/EOEA Innovative Stormwater Technology Transfer and Evaluation .....	59
04-06/319	Enhancing Implementation of Nutrient Management on Massachusetts Crop/Livestock Farms to Reduce the Risk of Nonpoint Source Pollution .....	63
05-01/319	Operation and Maintenance of the Massachusetts Alternative Septic System Test Center.....	71

<b>Appendix: 319 Nonpoint Source Program Projects 1990-2000 .....</b>	<b>73</b>
---	-----------



## INTRODUCTION

This report presents indicative summaries of the projects partially financed by the Section 319 Massachusetts Nonpoint Source Competitive Grants Program during federal fiscal years (FFY) 2001 through 2005. Projects funded from the inception of the program in 1990 through 2000 are listed in the Appendix at the end of this report.

Congress annually appropriates funds under Section 319 (319) of the Clean Water Act of 1987 (33 U.S.C.A., Sec. 1251 et. seq.) to assist states in implementing their approved nonpoint source (NPS) programs. Section 319 is administered by the US Environmental Protection Agency (EPA), which oversees the awards to individual states. The Massachusetts Department of Environmental Protection (Department), Bureau of Resource Protection, administers this award as part of the Massachusetts Nonpoint Source Program.

The 319 program focuses on the implementation of activities and projects for the control of nonpoint source pollution. EPA defines NPS pollution as that which is "caused by diffuse sources that are not regulated as point sources and are normally associated with precipitation and runoff from the land or percolation." The awards are intended to provide financial support for the state's programs for controlling the major statewide categories of NPS pollution or for protecting or improving NPS-impaired or threatened targeted water resources.

Each year, a portion of the 319 funds awarded to a state is used for specific watershed implementation projects that improve or protect threatened or impaired priority freshwater and coastal waters. Projects funded under this program must implement measures that address the prevention, control, and abatement of NPS pollution, and must result in restoration of beneficial uses or achieving or maintaining state water quality standards. A Request for Responses for competitive projects is issued by the Massachusetts Department of Environmental Protection in late winter. Proposals may be submitted by any interested Massachusetts public or private organization. The Department encourages all types of eligible, competitive proposals from all watersheds.

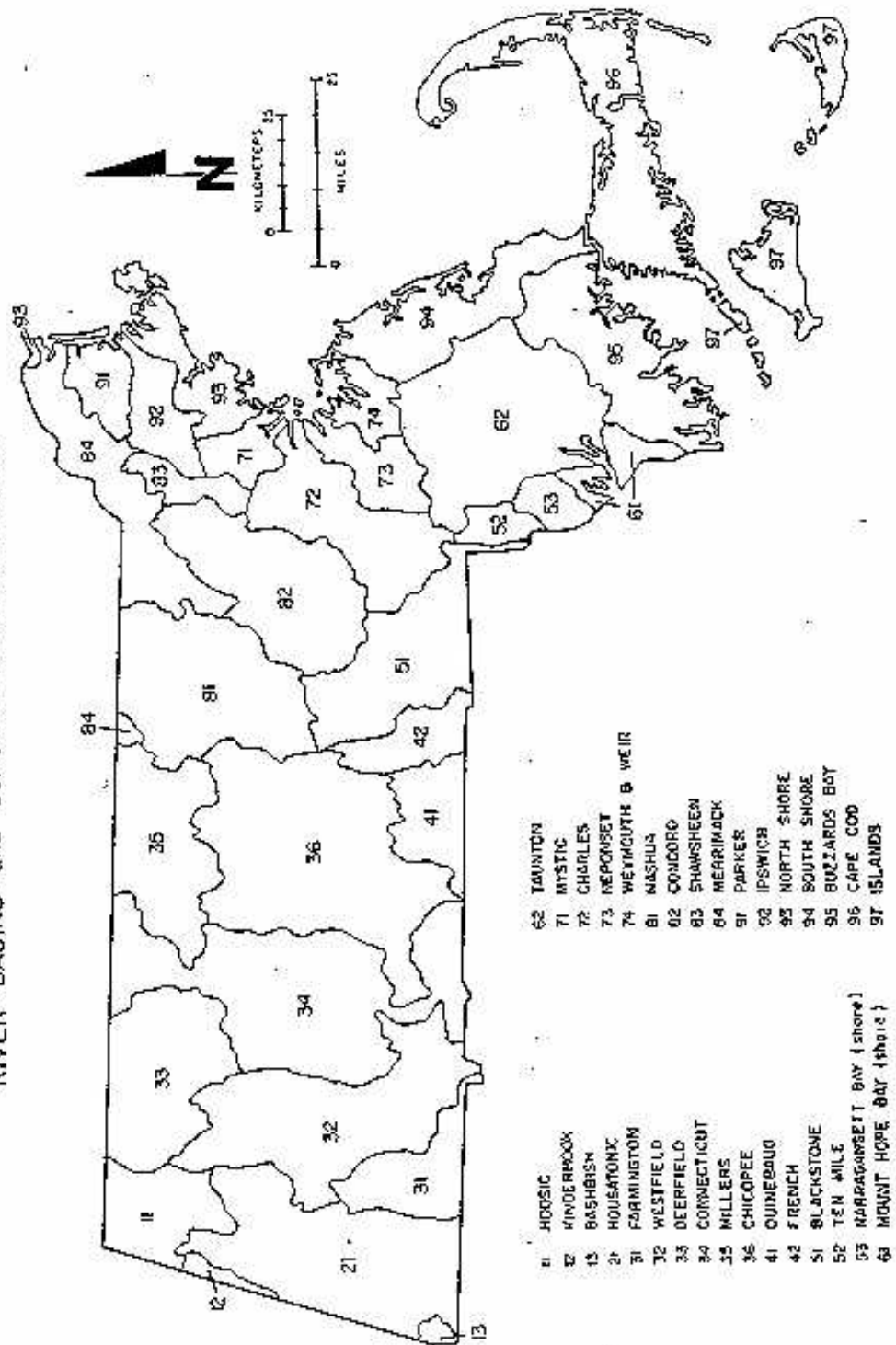
Since FFY '01, the Department has particularly encouraged proposals that will begin implementation of Massachusetts's Total Maximum Daily Load (TMDL) analyses, or that implement recommendations made in Diagnostic/Feasibility (D/F) or other studies for waters that do not meet Water Quality Standards. The Department also continues to encourage applicants to propose projects that support the Department's ongoing basin-wide water quality activities. The Massachusetts Nonpoint Source Management Plan, which was updated in 2001, now includes Section IV, Nonpoint Source Action Strategies, a primary source of information for identification of comprehensive, 319-eligible projects that will lead to water quality improvement. The Nonpoint Source Action Strategies are compiled in table format to show the Category 5/303(d) impairments, other outstanding water quality issues, data/information sources, and recommendations that address the water quality impairments for each of the 27 major watersheds.

An internal screening committee reviews all eligible 319 proposals. Projects selected by the Department for funding are included in the Department's yearly program plan, which is submitted to EPA prior to the start of the federal fiscal year. Once the program plan has been approved, the Department enters into a contractual agreement with the proposal proponent to conduct the project.

A 40% non-federal match is required from the grantee. This match may be cash or from in-kind services performed as part of the approved project activities. Unless specifically recommended in a TMDL, research, program development, assessment, planning, and water quality monitoring for assessment purposes are not considered implementation activities and are not eligible for 319 funding or match credit. The typical project timeline is for three years. A Quality Assurance Project Plan and an Operation and Maintenance Plan are required for each implementation project.

The Massachusetts river basins used in watershed planning are illustrated in Figure 1. Table 1 shows a comparison between the total number of projects funded through the 319 program in each basin, and the total projects costs in each basin since the inception of the program in 1990.

# COMMONWEALTH of MASSACHUSETTS RIVER BASINS and COASTAL DRAINAGE AREAS



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
**Number of 319 Projects and Allocation of Funds by Basin (1990-2005)**

**Table I**

<b><u>Basin Name</u></b>	<b><u>Number of Projects</u></b>	<b><u>Dollars Allocated</u> (match plus 319 funds)</b>
Hudson (Hoosic, Kinderhook, BashBish)	0	0
Housatonic	12	\$ 1,515,850
Deerfield	2	\$ 62,500
Westfield	2	\$ 21,4500
Farmington	4	\$ 173,200
Connecticut	11	\$ 2,065,000
Millers	1	\$ 330,000
Chicopee	5	\$ 799,400
Quinebaug	1	\$ 86,700
French	0	0
Nashua	5	\$ 691,700
Blackstone	7	\$ 1,604,309
Merrimack	5	\$ 620,600
Concord (SuAsCo)	8	\$ 1,110,560
Shawsheen	0	0
Parker	1	\$ 88,300
Ipswich	2	\$ 460,000
North Coastal	4	\$ 453,600
Boston Harbor (Mystic, Neponset, Weymouth & Weir)	9	\$ 1,720,400
Charles	6	\$ 1,093,100
South Coastal	12	\$ 2,705,650
Cape Cod	14	\$ 1,636,700
Islands	2	\$ 218,600
Buzzards Bay	19	\$ 2,560,800
Taunton	3	\$ 146,800
Narragansett Bay & Mount Hope Bay	0	0
Ten Mile	1	\$ 260,800
Statewide	37	\$ 3,878,000
<b>Total for 1990-2005</b>	<b>174</b>	<b>\$24,577,020</b>

Notes:

- Where projects encompass more than one basin, the grant allocation has been divided evenly among basins.
- Dollar amounts shown are total project costs and include 40% non-federal matching funds.
- All dollar amounts are rounded to the nearest \$10.

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 00-12/319

PROJECT TITLE: Salisbury Pond Resource Restoration  
NPS CATEGORY: Resource Restoration  
INVESTIGATOR: City of Worcester Parks, Recreation and Cemetery Department  
LOCATION: Blackstone River Watershed

#### DESCRIPTION:

Salisbury Pond is experiencing rapid filling due to sedimentation from upstream development and urban runoff. Several studies have been done on Salisbury Pond, including a 1987 D/F study and a 2000 MA DEP sediment investigation. A draft TMDL identified high phosphorus levels as the cause of high algal blooms and aquatic macrophytic vegetation. Contaminated sediment and high bacteria counts have also been problematic.

The project will design and install a structural BMP at the pond's main inlet to reduce phosphorus and sediment entering the pond. Two sediment chambers will be installed in upstream tributaries, with an anticipated 80% reduction in grit and oil. A steering committee will meet monthly to provide project oversight and facilitate public participation in the project.

Tasks to be completed under this project include:

1. Design, permitting and construction of structural best management practices at the main inlet to Salisbury Pond;
2. Design and construction of two underground sediment/contaminant removal systems in two subwatersheds, the Park Avenue outfall and the Weasel Brook subwatershed;
3. Maintenance of BMPs and sediment/contaminant removal systems;
4. Development and implementation of a DEP- and EPA-approved QAP; and
5. Outreach and education through storm drain stenciling and an educational kiosk.

PROJECT COST: \$ 297,000

FUNDING:	\$174,000 by the US EPA	\$ 5,000 by Tighe and Bond
	\$ 14,000 by Worcester Polytechnic Institute	\$61,500 by the Worcester DPW
	\$ 1,000 by the Regional Environmental Council	\$ 9,000 by the Norton Company
	\$ 8,000 by the Mill Brook Task Force	\$ 1,000 by Frost Manufacturing
	\$15,000 by the Worcester Parks Department	\$ 3,000 by the MA Dept. of Public Health
	\$ 4,000 by Massachusetts Audubon Society	

DURATION: 2002 - 2005

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 00-13/319

PROJECT TITLE: Implementation of Nutrient Management Standards on Massachusetts Crop/Livestock Farms to Reduce the Risk of Nonpoint Source Pollution  
NPS CATEGORY: Agriculture  
INVESTIGATOR: UMass/Amherst  
LOCATION: Statewide

#### DESCRIPTION:

The goal of this project is to reduce the risk of nonpoint source pollution from crop/livestock farms through implementation of best nutrient management practices by farmers. This project complements and builds upon a current 319 grant, Project 00-06/319, "Management Strategies for Massachusetts Dairy Farms to Reduce the Risk of Nonpoint Source Pollution." The new grant will use the tools developed in the current program to further work with farmers and encourage their participation in Comprehensive Nutrient Management Planning.

Tasks under this grant include:

1. Coordination of an inter-agency and farmer advisory committee;
2. Publication of written standards and guidelines for nutrient management practices;
3. Summary of available resources including educational materials, Internet resources, and a list of trained nutrient management planners;
4. Case studies based on development and implementation of nutrient management plans on selected farms;
5. Regional educational workshops and meetings for farmers and professionals; and
6. On-farm demonstrations of nutrient planning and best management practices.

PROJECT COST: \$289,192

FUNDING: \$ 154,620 by the US EPA  
\$ 134,572 by the University of Massachusetts

DURATION: 2002 - 2005

# MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

## SECTION 319 NPS PROJECT 00-14/319

PROJECT TITLE: Forestry Best Management Practices (BMP) Implementation Monitoring Protocol Project  
NPS CATEGORY: Forestry  
INVESTIGATOR: Massachusetts Department of Environmental Management  
LOCATION: Westfield Watershed and Statewide

### DESCRIPTION:

The purpose of the project is to develop a forestry BMP monitoring protocol for use in evaluating and monitoring the effectiveness of BMPs in controlling NPS pollution, in conjunction with forest harvesting operations conducted under the state's Forest Cutting Practices Act, Ch. 132 s. 40-48. Tasks include development of assessment methods to evaluate the effectiveness of BMPs contained in the Massachusetts BMP Manual, which are required in the MA Forest Cutting Practices Regulations. This will result in the development of performance standards for forestry BMPs. A draft field manual will be developed explaining the measurement and interpretation procedures. Field surveys on completed harvests in the Westfield watershed will be conducted to test the monitoring protocol, and the manual will be adjusted based on those findings.

The project is consistent with Forestry Actions/Implementation efforts outlined in the Massachusetts Nonpoint Source Management Plan, Volume I, p. 46. As forestry activity is generally regarded to be a source of nonpoint source pollution, particularly phosphorus, the development of performance standards and a rigorous investigation into the effectiveness of forestry BMPs will greatly enhance efforts to implement TMDLs in forested watersheds.

Tasks to be completed under this grant include:

1. Development of reliable assessment methods for evaluating forestry BMPs;
2. Development of performance standards for forestry BMPs;
3. Field surveys on completed harvests in the Westfield Basin to test the protocols and assessment methods being developed and tested; and
4. A field manual explaining the BMP evaluation procedures and performance standards.

PROJECT COST: \$118,203  
FUNDING: \$ 70,922 by the US EPA  
\$ 47,281 by the Massachusetts Department of Environmental Management  
DURATION: 2002 – 2005

## **MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

### **SECTION 319 NPS PROJECT 00-15/319**

PROJECT TITLE: Revision of the Massachusetts Nonpoint Source Management Manual  
NPS CATEGORY: General  
INVESTIGATOR: GeoSyntec Consultants  
LOCATION: Statewide

#### **DESCRIPTION:**

The purpose of this consultant contract is to develop and republish a nonpoint source pollution (NPS) management guide for municipal officials on behalf of the Department of Environmental Protection. The Massachusetts Nonpoint Source Management Manual (Manual) was originally published in 1993. The Manual described nonpoint source pollution problems that cause degradation of water quality. The Manual also identified and explained the human activities and multiple land uses associated with NPS pollution problems. Management alternatives for NPS problems were covered in terms of applicable federal, state, and local regulatory programs and appropriate Best Management Practices (BMPs). The Manual was written and designed to be user friendly to local officials who have little or no background knowledge or training in NPS pollution control.

Although the Manual is still useful to local officials, the information is dated and incomplete. The scope of the literature and research on NPS issues has broadened considerably since publication of the Manual, and a great deal of new material is available on the topic. In addition, new regulatory and funding programs such as the Stormwater Management Policy, the Rivers Protection Act, the Total Maximum Daily Load (TMDL) Program, National Pollution Discharge Elimination Program (NPDES), Phase II, the Source Water Protection Program, the 319 and 604b competitive grant programs, and the State Revolving Funds have been established to address NPS problems. Consequently, revisions to the Massachusetts NPS Manual must reflect current knowledge of the subject and new or revised regulatory programs. The revised Manual will be restructured to maximize accessibility of information in electronic format as well as in print.

The project deliverable is a nonpoint source management manual for Massachusetts municipal officials, based on the 1993 Massachusetts Nonpoint Source Management Manual. Revisions to the Manual will reflect current knowledge of the subject and must include information about new regulatory programs and funding options, still in a user-friendly format. The final product will be produced in three versions: hard copy, CD ROM, and Web-based.

Tasks to be completed under this grant include:

1. Development of a revised Massachusetts Nonpoint Source Management Manual in three versions: hard copy, Web-based, and CD-ROM; and
2. A distribution plan that will identify a strategy for effective distribution and evaluation of the revised Manual.

PROJECT COST: \$149,943

FUNDING: \$ 89,966 by the US EPA  
\$ 2,500 by GeoSyntec Consultants  
\$ 57,477 by the Massachusetts Department of Environmental Protection

DURATION: 2002 - 2005

# **MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

## **SECTION 319 NPS PROJECT 00-16/319**

**PROJECT TITLE:** Lake Wyola TMDL Implementation Project  
**NPS CATEGORY:** Resource Restoration  
**INVESTIGATOR:** EOEa, Division of Conservation and Recreation (formerly Department of Environmental Management)  
**LOCATION:** Connecticut Watershed

### **DESCRIPTION:**

Lake Wyola is a 129-acre recreational lake that supports swimming, boating, and fishing. The watershed of the Lake is 6.8 square miles in the towns of Shutesbury and Wendell. Lake Wyola is a Category 4A water (TMDL for phosphorus has been completed). In addition to phosphorus, Lake Wyola is impaired by organic enrichment/low dissolved oxygen and noxious aquatic plants. A Lake Management Plan was completed in 1997. Both the TMDL and the Lake Management Plan identify nonpoint source problems, and each presents recommendations to address them. Major problems are road management issues, shoreline erosion, septic system management, and invasive aquatic plants.

The goal of this project is to implement selected recommendations from the Lake Wyola Management Plan and Lake Wyola TMDL, and to continue the efforts of the towns of Shutesbury and Wendell, the Lake Wyola Advisory Committee, DCR, and the MDC to protect Lake Wyola and its watershed.

Project tasks include:

1. Development and implementation of a Quality Assurance Project Plan (QAPP);
2. Implementation of residential and roadway BMPs to control erosion and sedimentation;
3. Implementation of a comprehensive septic system management plan;
4. Prevention of the introduction of aquatic invasive species; and
5. Development of effective outreach and education materials to share lessons learned.

**PROJECT COST:** \$ 124,201

**FUNDING:** \$ 74,100 by the US EPA  
\$ 41,351 by EOEa/DCR  
\$ 8,750 by the Town of Shutesbury

**DURATION:** 2004 - 2007



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**SECTION 319 NPS PROJECT 00-17/319**

PROJECT TITLE: Local Development of Stormwater Best Management Practices on Residential Property:  
Overcoming Barriers to Implementation  
NPS CATEGORY: Urban Runoff/Outreach and Education  
INVESTIGATOR: EOE: DFWELE/Riverways  
LOCATION: Connecticut, South Coastal Watersheds

**DESCRIPTION:**

Municipalities are faced with many challenges when dealing with stormwater and its impacts on local river and stream systems. In addition to the changes that town government should make to institute best management and good housekeeping practices, the challenge is also to educate and engage citizens to enlist their participation in mitigating stormwater impacts. As we learn more about stormwater and the best ways to manage its impacts, the information must be shared with homeowners. This may involve changing their fundamental assumptions about stormwater and how to manage it.

This project will identify the barriers and motivations to people implementing stormwater Low Impact Development BMPs on their property, and will apply that information to the development of a targeted outreach and education program. Residents will become involved in developing projects so that they begin to reduce the amount of lawn they cultivate, replacing that area with rain gardens, trees, and native plantings. This will reduce the volume of stormwater runoff and the amount of nonpoint source pollution being contributed to stormwater from residential property.

Project tasks include:

1. The formation of focus groups;
2. Design and implementation of a survey to help identify barriers and motivations;
3. Educational workshops and outreach in response to survey feedback;
4. Design and installation of Low Impact Development BMPs; and
5. Project evaluation.

PROJECT COST: \$ 109,645

FUNDING: \$ 62,090 by the US EPA  
\$ 34,355 by DFWELE/Riverways  
\$ 13,200 by Stream Team volunteers

DURATION: 2004 - 2007

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 01-01/319

PROJECT TITLE: Lake Cochituate, Snake Brook NPS Remediation, Phase I  
NPS CATEGORY: Watershed Restoration  
INVESTIGATOR: Department of Environmental Management  
LOCATION: SuAsCo (Concord) Watershed

#### DESCRIPTION:

The project is Phase I of a larger plan to rehabilitate Lake Cochituate. BMPs will be installed to reduce the heavy loads of sediment in Snake Brook, and ultimately Lake Cochituate. Lake Cochituate is a large, high profile, multiple-use water body in need of restoration. This project will begin to address the sedimentation and nutrient loading from a major inflow (Snake Brook) that has accelerated eutrophication in the lake. It will result in measurable reduction in sediment and nutrient loading to Lake Cochituate prior to determining if dredging will be needed at the mouth of the brook. If dredging is ultimately needed, this project will help ensure that repeated dredging is not required.

Tasks to be completed as part of this project include:

1. Design and construction of a detention pond and wetland enhancement immediately east of where Snake Brook enters Lake Cochituate;
2. Design and construction of a detention pond and wetland enhancement for the drainage channel in the watershed;
3. Design and installation of five stormwater filtration basins along a subwatershed stormwater drain system;
4. Develop a GIS map of the stormwater drainage system within the Snake Brook watershed;
5. Pre- and post-construction water quality monitoring; and
6. Public education campaign.

The project goal is to mitigate sediment and nutrient loads from the Snake Brook watershed by decreasing pollutant loading coming from stormwater. This can restore the recreational, habitat and aesthetic values that have been lost due to sedimentation where Snake Brook enters Lake Cochituate. Project success will be measured through pre-and post-project water quality monitoring. The water quality monitoring program will be designed to measure key indicators of nutrient and sediment loading, including total phosphorus, total suspended solids, and turbidity.

PROJECT COSTS: \$235,346

FUNDING: \$129,500 by US Environmental Protection Agency  
\$ 85,950 by the MA Department of Environmental Management  
\$ 17,600 by the Town of Natick  
\$ 1,816 by the Town of Wayland  
\$ 480 in volunteer labor

DURATION: 2001-2004

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 01-02/319

PROJECT TITLE: Boat Waste Oil Recovery Program for New Bedford Harbor  
NPS CATEGORY: Demonstration Project  
INVESTIGATOR: Coastal Zone Management Buzzards Bay Project  
LOCATION: Buzzards Bay Watershed

#### DESCRIPTION:

The project implements a portion of the Buzzards Bay CCMP by recovering 30,000 gallons of oil per year. It includes recycling, educating and getting support from commercial vessel operators, marinas and oil retailers, and achieving 100% compliance with Waste Oil Recycling permitting requirements. The proponent estimates that the project will prevent 100,000 gallons of oil from entering New Bedford Harbor and reduce the US Coast Guard's need to respond to chronic small oil spills in the Harbor.

The project addresses a difficult problem, in that small oil spills are hard to trace to individual boats, and fishermen are notoriously hostile toward participating in programs that include regulation or fees. The waste oil recovery facility is a proven technology (it has been used in Texas) that will remain in place after this grant expires. This project complements a waste oil recovery project aimed at recreational boat owners that is currently funded through the CZM CCRP Program.

Tasks to be completed as part of this project include:

1. Construction of the oil reclamation and recycling facility;
2. Operation and maintenance of the facility;
3. Coordination of a Waste Oil Recovery Program with the New Bedford Harbor Development Commission;
4. Coordination and promotion of an enhanced voluntary recycling program for commercial vessels; and
5. Conducting workshops and outreach to improve compliance with Hazardous Waste and Waste Oil regulations.

The success of this project will be evaluated based on:

- The number of gallons of hydrocarbon collected through recycling and reclamation;
- The percentage of oil sold that is recycled and accounted for;
- The percentage of oil retailers accepting oil, which have obtained Waste Oil Recycling permits;
- Any bylaws or regulations adopted to facilitate oil recovery; and
- The number of oil sheen incidents that the US Coast Guard must respond to annually.

PROJECT COST: \$300,000

FUNDING: \$147,000 by US Environmental Protection Agency  
\$ 51,000 by the City of New Bedford  
\$ 96,000 by the New Bedford Harbor Development Commission  
\$ 1,000 by Coastal Zone Management  
\$ 5,000 by the Buzzards Bay Project

DURATION: 2001-2003

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 01-03/319

PROJECT TITLE: Parker Pond Restoration, Gardner  
NPS CATEGORY: Watershed Resource Restoration  
INVESTIGATOR: City of Gardner  
LOCATION: Millers Watershed

#### DESCRIPTION:

The project will fund part of Gardner's program to restore the warm water fishery and recreational potential of Parker Pond. It will address stormwater discharges by installing three Vortechs units and a phytoremediation system at a large stormwater discharge point. The larger program to restore the pond includes funded efforts to increase street sweeping, line 650 feet of a major storm drain, and reconstruct the outlet structures and seal the berm of Parker Pond Dam. The Army Corps of Engineers and Gardner are developing plans to dredge about seven feet of soft sediment to return the pond to a depth of ten feet.

The City of Gardner has already demonstrated its commitment to rehabilitating the pond. The ACOE will not proceed with dredging the pond until sediment and nutrient controls are in place in the contributing watershed. This grant will enable a community that has few resources for this type of project to pursue measure that can leverage ACOE participation in the dredging that will restore a recreational and fisheries resource for the City.

Tasks to be completed as part of this project include:

1. Design, permit and install three Vortechs stormwater treatment units;
2. Design, permit and construct a stormwater phytoremediation system at the outlet of Wasa Street;
3. Increase the frequency of street sweeping and stormdrain maintenance in downtown Gardner; and
4. Conduct an outreach and public education program.

The anticipated result of this grant project is to reduce excessive sediment, nutrient and related pollutant loading entering Parker Pond in stormwater from the Wasa Street drainage area. The project proponents anticipate removing 70-90% of sediments from stormwater entering the Vortechs units during the first flush of a rainstorm (based on information provided by the manufacturer). Research cited by the proponent estimates that phosphorus removal through the phytoremediation system will be 50%.

PROJECT COST: \$330,000

FUNDING: \$198,000 by the US Environmental Protection Agency  
\$132,000 by the City of Gardner

DURATION: 2001-2004

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 01-04/319

PROJECT TITLE: Massachusetts Buffer Manual and Demonstration Projects  
NPS CATEGORY: Demonstration Project  
INVESTIGATOR: Berkshire Regional Planning Commission  
LOCATION: Housatonic/Farmington Watersheds

#### DESCRIPTION:

The project will promote vegetated buffers as an effective and attractive way to minimize NPS pollution. It includes writing and promoting a "Buffer Manual," modeled after Maine's highly regarded manual, and installing five demonstration projects. The demonstrations will be at a wetland site (Berkshire Botanical Garden, Stockbridge), a recreational site (Big Pond, Otis), a riverbank site (Housatonic River, Great Barrington), a vernal pool (Kennedy Park, Lenox), and a lakefront site.

There is an audience and a need for this type of Massachusetts-specific manual accompanied by successful demonstration sites. Vegetated buffers minimize NPS pollution by lowering runoff velocity, trapping sediment, filtering pollutants and absorbing nutrients. However, property owners who desire the typical mowed lawn down to the banks of a lake or stream are often reluctant to maintain or create a buffer that they perceive might impair their access or view of the water. Property owners will more readily accept buffers if they understand the need for buffers and can witness "real life" demonstration projects that show that buffers can be designed to function both as water quality BMPs and as attractive landscape features.

Tasks to be completed as part of this project include:

1. Researching, drafting and distributing the Buffer Manual;
2. Designing, installing and monitoring five demonstration buffers; and
3. Conducting outreach and public education through workshops and on-site demonstrations.

Project success will be evaluated in two ways:

- The overall effectiveness of the demonstration sites will be documented and evaluated through photographing pre- and post-buffer conditions, calculating the increase in vegetative cover and recording the survival rate of the plants over a one-year span.
- Landowner and Conservation Commission views on buffers will be documented and evaluated through surveys of workshop participants. Surveys will also be sent to a wider audience of landowners and Conservation Commissions to develop a more complete profile of public attitudes.

PROJECT COST: \$147,440

FUNDING: \$ 84,759 by the US Environmental Protection Agency  
\$ 50,127 by demonstration site owners  
\$ 2,554 by the MA Department of Environmental Management  
\$ 10,000 by the MA Watershed Initiative

DURATION: 2001-2004

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 01-05/319

PROJECT TITLE: Evaluation of Phosphorus Removal in Onsite Septic Systems  
NPS CATEGORY: Demonstration Project  
INVESTIGATOR: Barnstable County Department of Health and the Environment  
LOCATION: Buzzards Bay/statewide

#### DESCRIPTION:

The project will test a minimum of four different onsite septic technologies that purport to remove phosphorus, and test the efficacy of installing phosphorus-removing reactive media beneath standard septic systems. The project also includes a report on the feasibility of scaling up the tested technologies to serve small clustered areas of development and the potential for using small packaged treatment plants for removing phosphorus from wastewater. The goal is to develop proven options for reducing phosphorus inputs to fresh water bodies from onsite septic systems. Testing will be done at the Massachusetts Alternative Septic System Test Center.

Tasks to be completed as part of this project include:

1. Install four or five technologies and test influent and effluent bi-weekly for one year for orthophosphate, total phosphorus, alkalinity, pH, temperature and dissolved oxygen (technologies to be tested are the Wallax System, the PHOSPHEX, the Waterloo Biofilter, the Krafta Compact Clarifier and one other yet to be identified);
2. Field test at least three different media for their ability to enhance phosphorus removal when installed beneath standard septic systems;
3. Prepare a report that presents options for the control of phosphorus inputs to surface water from septic systems, placing all options in perspective and in context with present state regulations; and
4. Conduct an educational and outreach program, including workshops for Boards of Health and lake associations and publication of research results.

This research project will support implementation of Total Maximum Daily Loads (TMDL) of phosphorus to freshwater bodies that currently do not meet water quality standards. All information that can be used to reduce phosphorus inputs will be vital in implementing lake TMDLs in coming years. It will also further the goals of the Department's Title 5 Program that approves alternative onsite septic systems and alternatives to onsite septic systems where appropriate.

PROJECT COST: \$89,358

FUNDING: \$53,139 by the US Environmental Protection Agency  
\$22,500 by the owners of the alternative septic technologies to be tested  
\$13,719 by the Barnstable County Department of Health and the Environment

DURATION: 2001-2003

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 01-06/319

PROJECT TITLE: Memorial Pond Restoration, Phase I  
NPS CATEGORY: Watershed Resource Restoration  
INVESTIGATOR: Town of Walpole  
LOCATION: Boston Harbor (Neponset) Watershed

#### DESCRIPTION:

The project is the first phase of a larger plan to rehabilitate Memorial Pond in Walpole. Stormwater BMPs (sediment forebays followed by constructed wetlands or extended swales/detention ponds) will be built at two stormwater discharges (Stone Street and East & Diamond Streets) that were identified in *Memorial Pond Investigation and Management Plan* (1999) as major sources of sediment and nutrients to the Pond. It will result in measurable reduction in sediment and nutrient loading to Memorial Pond prior to undertaking a planned dredging project to remove sediments and nuisance aquatic vegetation in the pond. Nonpoint source pollutant inputs will be addressed first to help ensure that repeated dredging is not required. The outlet to the pond will also be rebuilt to allow future drawdowns needed to control nuisance aquatic vegetation.

Tasks to be completed as part of this project include:

1. Design, construct and monitor stormwater BMPs (sediment forebays followed by constructed wetlands or extended swales/detention ponds) at Stone Street and at East and Diamond Streets;
2. Prioritize additional storm discharges for treatment; and
3. Design and construct a modified pond outlet structure with drawdown capability.

The project goal is to mitigate sediment and nutrient loads in Memorial Pond by decreasing contaminants coming from stormwater. This will maintain the pond as an important aesthetic feature in the Town. Project success will be measured through pre-and post-project water quality monitoring. The water quality monitoring program will be designed to measure key indicators of nutrient and sediment loading, including total phosphorus and total suspended solids. Actual measured performance of the stormwater BMPs will be compared to both the predicted performance of the BMPs based on their design, and the performance of similar stormwater BMP systems reported in the literature.

PROJECT COST: \$199,950

FUNDING: \$119,950 by the US Environmental Protection Agency  
\$ 80,000 by the Town of Walpole

DURATION: 2001-2004

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 01-07/319

PROJECT TITLE: Wareham NPS Remediation Program: East River, Broad Cove, Muddy Cove  
NPS CATEGORY: Subwatershed Project  
INVESTIGATOR: Town of Wareham  
LOCATION: Buzzards Bay Watershed

#### DESCRIPTION:

The northern portion of Onset Bay is closed to shellfishing from May 1<sup>st</sup> through November 1<sup>st</sup>, due in large part to fecal contamination associated with stormwater runoff. The 1989 report entitled *Sanitary Survey Report of Onset Bay in the Towns of Bourne and Wareham* identified fecal contamination as the principal contributing factor in shellfish bed closures in the area. The Town of Wareham has made substantial investment to sewer the Onset and Point Independence areas and so has virtually eliminated failing or substandard septic systems as a source of fecal contamination to the Bay. The Town has also undertaken a comprehensive stormwater management program and has made significant progress in remediating stormwater discharges at several problem areas in town.

This project will install stormwater BMPs (i.e.; deep sump catch basins, infiltration chambers and possibly Stormtreat systems) at seven stormwater outlets in Onset village. The BMPs will be installed on town land in the road right-of-way at one site at the East Avenue boat ramp, four sites along North Boulevard, one site at the Stone Bridge Marina and one site off of East Boulevard. The project augments previous projects undertaken by the Town of Wareham to remediate stormwater impacts to local shellfish beds. The work done in this project will be upstream of work done as part of another 319-funded project (00-09/319), which addressed four stormwater outfalls that discharge directly into Onset Bay, and a similar project funded through the CZM CPR Program.

The goals of the project are to upgrade the seasonally closed shellfishing areas of Onset Bay, protect swimming beaches along Onset Bay and begin remediation of estuarine resources in the Bay by reducing fecal coliform entering Onset Bay.

Tasks to be completed as part of this project include:

1. Design, permitting and construction of BMPs for seven discharge locations; and
2. Pre- and post-construction water quality monitoring.

Project success will be monitored through pre- and post-construction water quality monitoring at the stormwater discharge points and through ongoing water quality sampling performed by the Massachusetts Division of Marine Fisheries. Positive effects should be immediately observable as each outlet is remediated. Reducing fecal coliform pollution and improving the health of the shellfish stock will be the ultimate gauge of success for this project.

PROJECT COST: \$455,000  
  
FUNDING: \$273,000 by the US Environmental Protection Agency  
\$182,000 by the Town of Wareham  
  
DURATION: 2001-2004



## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 01-08/319

PROJECT TITLE: Gray's Beach Park Restoration, Kingston  
NPS CATEGORY: Watershed Restoration Project  
INVESTIGATOR: Town of Kingston  
LOCATION: South Coastal Watershed

#### DESCRIPTION:

This project is part of Kingston's 2000 Stormwater Project that seeks to install stormwater BMPs at a number of sites to improve water quality in the Jones River, Kingston Bay and Plymouth Bay. This phase of the overall project is the redesign of the Gray's Beach Park recreation area to reduce soil erosion and pollution caused by stormwater runoff. BMPs to be installed include swales, sand filters, curbing, and deep sump catch basins. Anticipated environmental benefits will be to treat and redirect stormwater away from Kingston's only public swimming beach, and to begin the work needed to reopen the shellfish beds in Kingston Bay that have been closed for several years. This project complements the NPS reductions from ongoing sewer installation in the Rocky Nook area of Kingston and from a nonpoint source pollution remediation project funded through the CZM CPR Program.

Tasks to be completed as part of this project include:

1. Site preparation where sand filters and swales will be constructed;
2. Design and install deep sump catch basins near the boat ramp;
3. Regrade recreational lawn area and design and construct water quality swales and drainage channel parallel to the beach;
4. Install curbing;
5. Regrade beach area and design and construct boulder retaining wall and dunes;
6. Design and construct sand filter to treat stormwater before outfall; and
7. Conduct pre- and post-construction water quality monitoring.

Success of the project will be evaluated through continued water quality monitoring and monitoring for erosion and scouring at the boat ramp and boardwalk area. Short-term environmental improvements include improved water quality in Kingston Bay and Gray's Creek, improved water quality at the public swimming area, and elimination of erosion at the beach and boat ramp. Long-term improvements that are expected from the overall stormwater management program include reopening the closed shellfish beds.

PROJECT COST: \$125,000

FUNDING: \$75,000 by the US Environmental Protection Agency  
\$50,000 by the Town of Kingston

DURATION: 2001-2004

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 01-09/319

PROJECT TITLE: Nashawannuck Pond Restoration, Phase II  
NPS CATEGORY: Watershed Resource Restoration  
INVESTIGATOR: City of Easthampton  
LOCATION: Connecticut Watershed

#### DESCRIPTION:

Over the past twenty years, Nashawannuck Pond, a large, multiple-use water body within Easthampton, has been reduced in size due to sedimentation caused by residential development and road maintenance. Heavy phosphorus loading resulting from the constant sediment loading is accelerating aquatic weed growth and eutrophication in the pond. This project will implement recommendations from the 1990 Diagnostic/Feasibility study and build upon previous activities to improve the water quality of the pond. Stormwater BMPs (3-6 Vortechs Systems, improvements to eight catch basins, and purchase of a vacuum maintenance system for cleaning the Vortechs units) will be implemented on Broad Brook to reduce sediment and nutrient loads to Nashawannuck Pond. This project will expand on work done to stabilize the banks of Nashawannuck Pond in project 98-05/319.

Tasks to be completed as part of this project include:

1. Design and install three to six Vortechs units along the eastern shoreline of the pond and at two road crossings on Hendricks Street on Broad Brook;
2. Design and install eight deep-sump catch basins between Holyoke Street and the pond;
3. Purchase a maintenance system for the Vortechs units;
4. Prepare an educational video detailing the project;
5. Conduct a training forum for regional Departments of Public Works; and
6. Conduct pre- and post-construction water quality monitoring.

Success of the project will be measured in the long-term by the reduction of sediment in Nashawannuck Pond. Indicators of success in the short-term will be improved water quality measured through the pre- and post-construction water quality monitoring program, and through an analysis of the weight and composition of the sediments removed from the catch basins and Vortechs systems.

PROJECT COST: \$171,420

FUNDING: \$102,852 by the US Environmental Protection Agency  
\$ 12,600 by the Pioneer Valley Planning Commission  
\$ 55,968 by the City of Easthampton

DURATION: 2001-2004

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 01-10/319

PROJECT TITLE: Development and Demonstration of a Lake Watershed Survey Program  
NPS CATEGORY: Resource Restoration  
INVESTIGATOR: Massachusetts Department of Fisheries, Wildlife and Environmental Law  
Enforcement/Riverways Program  
LOCATION: Statewide

#### DESCRIPTION:

This project is intended to provide technical assistance for lake/watershed groups to assist them in collecting information and providing stewardship to remediate impaired water bodies. Utilizing the DEP Watershed Survey Manual and data sheets developed in cooperation with DEP, Riverways and other partners, Riverways will educate stakeholders, including citizens and municipal officials, about (1) watershed ecology and general impacts from nonpoint source pollution; (2) causes of nonpoint source pollution in their particular watershed; (3) ways in which stakeholders can work together to address the problems; (4) resources and technical assistance that are available to assist with the endeavor. Lakes with TMDLs and those participating in the EOEALakes and Ponds Initiative will be targeted for participation in this project.

The primary objectives of the project are to:

- build stakeholder capacity in each selected watershed;
- develop a clear understanding of watershed issues and possible causes of impairment;
- identify issues and possible causes of impairment in each watershed;
- facilitate efforts leading to remediation of impaired surface waters; and
- ensure continuation of the program through Train The Trainer workshops.

The following tasks will be completed under this project:

1. A Technical Advisory Committee will be established for the program. Agency staff as well as nonprofit lakes and ponds organizations such as COLAP, LAPA West, and MA WaterWatch Partnership will be invited to serve on the committee.
2. The Watershed Survey Coordinator will directly contact and recruit up to 10 lake/watershed groups as project participants. Participants will receive training and technical assistance on nonpoint source pollution and watershed issues. Each group will conduct a watershed survey for its own lake watershed.
3. The Watershed Survey Coordinator will facilitate an action planning meeting in each watershed. Based on the results of watershed surveys, each project participant will develop priorities and action plans for their watershed. Each group will be provided with comprehensive information about potential sources of funding and technical assistance to help carry out the identified actions.
4. The Watershed Survey Coordinator will oversee compilation of a watershed Survey Report for each watershed, summarizing findings of each survey and prioritizing actions to be taken.
5. To ensure that the work continues, at least three future trainers will be recruited to be trained as watershed survey coordinators and facilitators.
6. Project summary and results will be posted and maintained on the worldwide web

PROJECT COST: \$177,212

FUNDING: \$100,000 by the US Environmental Protection Agency  
\$ 77,212 by the Massachusetts Department of Fisheries, Wildlife and Environmental  
Law Enforcement/Riverways Program

DURATION: 2002 - 2003

## **MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

### **SECTION 319 NPS PROJECT 01-12/319**

PROJECT TITLE: Cranberry Bog Phosphorus Dynamics for TMDL Development  
INVESTIGATOR: University of Massachusetts Cranberry Experiment Station  
LOCATION: Statewide

#### **DESCRIPTION:**

This project will study phosphorus dynamics in selected Massachusetts cranberry bogs to assist the Department in formulating Total Maximum Daily Load (TMDL) performance standards.

Specifically, this project will: (1) determine phosphorus and nitrogen import and export from representative cranberry beds associated with water management, including floods, irrigation, and rain events; (2) determine nitrogen and phosphorus export from a natural freshwater wetland; (3) determine phosphorus and nitrogen export from beds where phosphorus fertilizer rates are reduced to less than 20 lb phosphorus/acre; and (4) determine the impact of reduction in phosphorus fertilization on cranberry sustainability.

#### **Tasks include:**

1. Preparation of a Quality Assurance Project Plan (QAPP);
2. Select and study six bogs and one natural wetland reference site;
3. Determine water and nutrient budgets;
4. Perform soil nutrient and tissue analysis;
5. Monitor crop yields and crop quality; and
6. Conduct field fertilizer plot experiments.

PROJECT COST: \$288, 040

FUNDING: \$187, 197 by the US Environmental Protection Agency  
\$100, 843 by the University of Massachusetts

DURATION: 2001-2004

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 01-13/319

PROJECT TITLE: Lake Buel Implementation and Demonstration Project  
NPS CATEGORY: Resource Restoration  
INVESTIGATOR: Berkshire Regional Planning Commission  
LOCATION: Housatonic Watershed

#### DESCRIPTION:

Lake Buel is 303d listed for nutrient impairment. A D/F study completed for the lake in 1982 indicates that a large volume of the total annual phosphorus load enters from the northern inlet. Several other subsequent studies have also addressed the impairment problems at Lake Buel, particularly the infestation of non-native aquatic species related to excess nutrients/phosphorus. Many of the recommendations of those studies have already been implemented, including weed harvesting and water quality monitoring.

This project seeks to implement remaining recommendations of the D/F study and the 1997 MADEP Water Quality Assessment. The following tasks will be conducted as part of this project:

1. Monitor water quality and develop a QAPP;
2. Design and install one or more stormwater BMPs at the north cove inlet;
3. Conduct a plant replacement project to establish *Chara*, a native non-nuisance species, as a replacement for the currently dominant milfoil;
4. Design and install one or more stormwater BMPs at the public boat ramp;
5. Develop a septic system maintenance program for the Lake District;
6. Develop drainage standards for subdivisions in watershed communities;
7. Conduct annual weed harvesting; and
8. Develop and conduct an outreach and education program.

PROJECT COST: \$164,846

FUNDING: \$ 98,346 by the US Environmental Protection Agency  
\$ 2,000 by the Berkshire Regional Planning Commission  
\$ 16,000 by the Massachusetts Public Access Board  
\$ 48,500 by the Lake Buel Restoration Preservation District

DURATION: 2002 - 2005

# MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

## SECTION 319 NPS PROJECT 01-14/319

PROJECT TITLE: Pontoosuc Lake Watershed Resource Restoration Project  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Town of Lanesborough  
LOCATION: Housatonic River Watershed

### DESCRIPTION:

This project builds upon a FFY 99 s319 project (99-03/319) to implement recommendations of a 1999 D/F study. Three other reports have also been completed, each documenting the problems at Pontoosuc Lake. Several recommendations from those studies have been implemented to date. This project will install a stormwater BMP that was designed under the previous grant. In addition, areas of erosion near the BMP locations will be stabilized to prevent sedimentation from entering the lake. The Housatonic Valley Association will conduct a storm drain stenciling and public outreach program to help watershed residents understand the role they can play in reducing NPS, and an ongoing weed harvesting program will be continued.

Activities under this grant that seek to further improve water quality at Pontoosuc Lake include:

1. Installing a stormwater BMP in a priority location;
2. QAPP development and water quality monitoring;
3. Stenciling storm drains;
4. Erosion control;
5. Weed harvesting; and
6. Implementing source controls.

PROJECT COST: \$93,883

FUNDING: \$ 55,990 by the US EPA  
\$ 31,455 by the Town of Lanesborough  
\$ 750 by the Housatonic Valley Association  
\$ 5,000 by the Berkshire Regional Planning Commission  
\$ 688 by the Housatonic EOEa Watershed Team

DURATION: 2002 - 2005

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 01-15/319

PROJECT TITLE: Implementing a Stormwater Remediation Strategy at Ashmere Lake  
NPS CATEGORY: Resource Restoration  
INVESTIGATOR: Town of Hinsdale  
LOCATION: Housatonic Watershed

#### DESCRIPTION:

Ashmere Lake is 303d listed for noxious aquatic plants. Several studies have identified problems at the Lake and have recommended solutions. This project seeks to implement a comprehensive stormwater remediation strategy recommended by studies to prevent sedimentation from gravel roads and prevent the spread of non-native aquatic species. The Town will be supported by the Berkshire Regional Planning Commission in carrying out this project.

#### Specific tasks include:

1. Develop a QAPP and conduct pre-and post-construction monitoring;
2. Design and install BMPs for road runoff diversion and treatment;
3. Prepare an operation and maintenance plan and program for catch basin maintenance;
4. Conduct an outreach and technology transfer program that includes a storm drain stenciling program, signage at lake access points, and training for municipal officials using the NEMO model;
5. Develop a lake management plan; and
6. Conduct in-lake treatment of non-native invasive aquatic plant species.

PROJECT COST: \$175,926

FUNDING: \$104,610 by the US EPA  
\$ 66,020 by the Town of Hinsdale  
\$ 2,250 from the Berkshire Regional Planning Commission  
\$ 3,046 from the Housatonic Valley Association

DURATION: 2002 - 2005

# MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

## SECTION 319 NPS PROJECT 01-16/319

PROJECT TITLE: Plymouth Road Stormwater Treatment System  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Town of Bellingham Department of Public Works  
LOCATION: Charles River Watershed

### DESCRIPTION:

The Charles River is 303d listed in several locations for multiple pollutants including nutrients, organics, low dissolved oxygen, and pathogens. The Town's Comprehensive Water Resources Management Plan indicates that overland stormwater runoff plays a large role in the degradation of Charles River water quality.

This project will install a stormwater treatment system consisting of a degritter, oil/water separator, and infiltration trenches at the outfall to the Charles River on Plymouth Road. This system is anticipated to reduce the discharge of first flush TSS to zero, and remove 80% of TSS for the 2-year 24-hour storm. The infiltration feature of the BMP will recharge groundwater upstream of the outfall to help maintain flows during dry weather.

Tasks to be completed under this grant include:

1. Develop a QAPP and conduct pre- and post-water quality monitoring;
2. Design and construct a stormwater treatment system; and
3. Develop and implement an outreach and technology transfer program.

PROJECT COST: \$79,960

FUNDING: \$45,000 by the US EPA  
\$34,960 by the Town of Bellingham

DURATION: 2002 - 2005



## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 01-17/319

PROJECT TITLE: North Green Stormwater Management Project  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Town of Ipswich Department of Public Works  
LOCATION: Ipswich River Watershed

#### DESCRIPTION:

The North Green area is located in downtown Ipswich, adjacent to the Ipswich River. There is no enclosed drainage system in this area, and stormwater runoff sheet-flows into the Ipswich River. Two studies prepared for the Town of Ipswich conclude that urban runoff is the largest contributing factor to stormwater pollution in the Ipswich River.

The goal of this project is to treat stormwater from the North Green area before it enters the river. This will be accomplished by constructing a closed drainage system in the area, consisting of deep sump catch basins, catch basins with outlet hoods, and Stormceptor/Vortechs units. It is anticipated that 80% of TSS will be removed from the stormwater prior to discharge into the River. Matching funds will come from Coastal Pollution Abatement Funds and from local Ch. 90 money, as well as in-kind contributions from the Town.

Tasks for this project include:

1. Develop a QAPP and conduct pre- and post construction water quality monitoring;
2. Field survey of the project area;
3. Environmental permitting;
4. Engineering, design and construction of a closed drainage system; and
5. Outreach and technology transfer.

PROJECT COST: \$398,548

FUNDING: \$228,000 by the US EPA  
\$ 50,000 by the Massachusetts Coastal Zone Management  
\$120,548 by the Town of Ipswich, including \$62,000 of Chapter 90 funds

DURATION: 2002 - 2005

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 01-18/319

PROJECT TITLE: Lagoon Pond Runoff Renovation Project  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Town of Oak Bluffs  
LOCATION: Islands Watershed

#### DESCRIPTION:

Lagoon Pond receives direct discharge of untreated stormwater at three locations. Fecal coliform bacteria is a known pollutant carried by this runoff. Nitrogen, phosphorus, and BOD typical of residential stormwater are also suspected to be present. A Lagoon Pond study funded by 604(b) identified this situation as needing corrective action.

The project will infiltrate and thereby treat the first flush of stormwater from the three sources to remove bacteria, BOD, and phosphorus. This will be accomplished by installing catch basins and infiltration systems designed to capture the first flush of stormwater.

Tasks to be completed under this project include:

1. Construction of runoff interception, infiltration and treatments systems at three subwatersheds; sites: Vineyard Avenue, Lagoon Road, and Hudson Avenue; and
2. Outreach and technology transfer through placement of educational signage at each project area and regular press releases.

PROJECT COST: \$ 122,745

FUNDING: \$ 73,030 by the US EPA  
\$ 48,966 by the Town of Oak Bluffs  
\$ 750 by the Dukes Conservation District

DURATION: 2002 - 2005

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**SECTION 319 NPS PROJECT 01-19/319**

PROJECT TITLE: Oldham and Furnace Pond Stormwater Treatment  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Town of Pembroke  
LOCATION: South Coastal Watershed

**DESCRIPTION:**

A 1993 D/F study found high levels of nutrients and invasive aquatic vegetation in both Oldham Pond and Furnace Pond. Stormwater impacts were also noted in the study. A subsequent DEM study made specific recommendations for stormwater BMPs.

This project will implement structural and non-structural BMPs to prevent the key pollutant, phosphorus, from entering the ponds. This will be done by converting twenty-nine catch basins to leaching catch basins; cleaning, widening, and revegetating a drainage ditch; and strengthening local controls on sedimentation and erosion.

Tasks to be completed under this grant include:

1. Design, permitting and construction of stormwater best management practices at twenty-nine locations;
2. Modification of town sedimentation and erosion control bylaws and regulations;
3. A DEP- and EPA-approved QAPP for monitoring the effectiveness of the BMPs; and
4. Development and distribution of educational brochures targeted to watershed residents about lawn care and fertilizer use, pet waste, and waterfowl management. Letters will be sent to lawn care professional encouraging conservative application of fertilizers in the watershed.

PROJECT COST: \$194,448  
  
FUNDING: \$116,669 by the US EPA  
\$ 77,779 by the Town of Pembroke  
  
DURATION: 2002 - 2005

# **MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

## **SECTION 319 NPS PROJECT 01-20/319**

PROJECT TITLE: Lake Attitash Stormwater Treatment Program  
NPS CATEGORY: Resource Restoration  
INVESTIGATOR: Town of Amesbury  
LOCATION: Merrimack Watershed

### **DESCRIPTION:**

Lake Attitash is a 360-acre natural lake used for recreation. Water quality in the Lake has been a problem for several years, evidenced by algae and weed growth as well as beach closures. Previous studies have indicated that stormwater is a significant contributor to the water quality problems.

Based on recommendations from a DEM-funded study, this project focuses on implementation of structural and non-structural stormwater BMPs in one of the largest direct drainage contribution areas of Lake Attitash. Three direct discharges will be treated by one structural BMP, consisting of a series of baffle tanks designed to reduce velocity and trap sediment.

Tasks to be performed include:

1. DEP and EPA approved QAPP to determine the effectiveness of the BMPs;
2. Design, permitting and installation of stormwater best management practices at three direct discharges into the Lake; and
3. A half-day seminar to present project results to watershed residents, and others.

PROJECT COST: \$163,675  
  
FUNDING: \$98,205 by the US EPA  
\$65,470 by the Town of Amesbury  
  
DURATION: 2002 - 2005

# MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

## SECTION 319 NPS PROJECT 01-21/319

PROJECT TITLE: Lake Quinsigamond and Lake Ripple Restoration Project  
NPS CATEGORY: Resource Restoration  
INVESTIGATOR: Lake Quinsigamond Commission  
LOCATION: Blackstone River Watershed

### DESCRIPTION:

Water quality in Lake Quinsigamond and Lake Ripple has degraded due to increased urban runoff and nutrient loading, as identified in the TMDL for Lake Quinsigamond and a 1987 D/F study. Lake Quinsigamond is 303d-listed for nuisance aquatic plants and organic enrichment/low dissolved oxygen. Lake Ripple suffers from high salt and sand runoff from Routes 122 and 140. No TMDL has been done for Lake Ripple, but the grantee feels it would be unlikely to meet clean water standards.

The project will implement structural and nonstructural BMPs to address NPS pollution, primarily phosphorus, in the Lake Quinsigamond watershed, and sediment loading in Lake Ripple. This project is identified as a priority in the Blackstone River Basin FY 2001 EOEa Watershed Team Workplan.

### Specific tasks include

1. Water quality sampling;
2. Design and installation of a sediment removal BMP for Lake Ripple;
3. Stream bank restoration in the Quinsigamond River;
4. Mapping of storm drains into Lake Quinsigamond and Flint Pond;
5. Installation of a phosphorus and sediment removal BMP for Lake Quinsigamond; and
6. Removal of sediment under Route 20 at Half Moon Bay.

PROJECT COST: \$405,000

FUNDING:	\$243,000 by the US EPA	\$ 3,000 Grafton DPW
	\$ 67,500 Shrewsbury Engineering Dept.	\$ 13,800 Town of Shrewsbury
	\$ 25,740 Graves Engineering/Town of Grafton	\$ 24,800 MA Environmental Trust
	\$ 4,360 Lake Quinsigamond Commission	\$ 2,000 Shrewsbury Health Dept
	\$ 3,000 Shrewsbury Highway Dept.	\$ 6,000 Students/Grafton H.S. and Shrewsbury H.S.

DURATION: 2002 - 2005

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 01-22/319

PROJECT TITLE: Stormwater Management Plan at the Millyard Marketplace  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Town of Sturbridge  
LOCATION: Quinebaug Watershed

#### DESCRIPTION:

Impervious parking area around the Millyard Marketplace, which is adjacent to the Quinebaug River, causes flash flooding during storm events. In addition, stormwater runoff from the parking lot contributes non-point source pollution directly into the River. This project focuses on implementing BMPs that will abate the flash flooding and improve the water quality of discharge at the Marketplace.

BMPs to be implemented include construction of 250 linear feet of low-gradient trough around portions of the parking area that will detain sediment, and 440 linear feet of low-gradient, serpentine grassed waterway that will remove fines and nutrients. A vortex-type BMP will be installed to treat stormwater flowing from the storm sewer at Route 20, and a concrete sediment basin will be installed at the Route 20 outlet pipe. Two new catch basins will be installed to better control the Route 20 stormwater. A new public park will be created that will include an educational kiosk. This is a priority project in the FY 2002 French/Quinebaug EOEa Watershed Team Plan.

Tasks to be completed under this grant include:

1. Planting swales and filter strips to slow runoff into the river;
2. Removal and relocation of a parking lot and widening of the existing buffer;
3. Installation of improved drainage from Route 20;
4. Renovation of an existing detention basin to improve volume and filtration capacity; and
5. Creation of a new public park with education kiosk.

PROJECT COST: \$ 86,660

FUNDING: \$ 51,660 by the US EPA  
\$ 35,000 by the Massachusetts Turnpike Authority

DURATION: 2002 - 2005

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 01-23/319

PROJECT TITLE: Demonstration of Innovative Stormwater Management Retrofit Systems  
NPS CATEGORY: Urban runoff  
INVESTIGATOR: Center for Urban Watershed Renewal  
LOCATION: North Coastal Watershed

#### DESCRIPTION:

The project seeks to demonstrate the feasibility of retrofitting existing urbanized landscapes with best management systems that will increase infiltration rates, provide filtering mechanisms for stormwater runoff, and improve the water quality of runoff. The project will install a volume dependent stormwater retention planter, a vegetated infiltration system, and a vegetated roof at two sites on the North River in Salem.

Tasks to be completed include:

1. Prepare a final design for the stormwater retrofitting systems;
2. Site preparation for installation of stormwater management retrofitting systems;
3. Construction of stormwater management retrofitting systems, including volume-dependent stormwater retention planters; vegetated infiltration systems; structural support for vegetated roofs; and vegetated roofs;
4. Preparation and implementation of QAPP for monitoring pre- and post- construction effectiveness of BMPs; and
5. Technology transfer including production of a documentary video, open houses, seminar and training session, and final report relating project details.

PROJECT COST: \$175,370

FUNDING: \$ 85,637 by the US EPA  
\$ 89,733 by The Bioengineering Group, Inc.

DURATION: 2002 - 2005

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 01-24/319

PROJECT TITLE: Storm Water System Maintenance and Residuals Waste Handling  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: City of Quincy  
LOCATION: Boston Harbor Watershed

#### DESCRIPTION:

Storm water runoff is negatively impacting the natural and recreational resources at Wollaston Beach. Chronic bacteria problems cause frequent swimming advisories and have a negative impact on surrounding marsh areas. Stormwater from eight outfalls discharges directly onto Wollaston Beach. The City has developed a five-year capital plan to restore water quality at Wollaston Beach. The plan includes eliminating sources of pollution by upgrading sewer and storm drains.

The project seeks to obtain a Beneficial Use Determination for catch basin residuals. Disposal of catch basin residuals is a statewide problem that will grow more serious with the onset of Phase II Stormwater requirements, and development of a BUD is seen as the first step toward solving the problem on a statewide basis. Anticipated results include development of guidelines for other cities and towns seeking to use a similar strategy for disposal of this material. Ideally, the quality of catch basin residuals can be related to land use surrounding the catch basin, enabling development of a set of standard land use-based protocols.

Tasks under this project include:

1. Assessment of city stormwater collection procedures including development and implementation of a DEP- and EPA-approved QAPP;
2. Development of an operation and maintenance plan for the existing collection system;
3. Construction of a processing area for catch basin residuals; and
4. Development of additional Beneficial Use Determinations based on collected data.

PROJECT COST: \$ 143,389

FUNDING: \$ 85,535 by the US EPA  
\$ 57,854 by the City of Quincy

DURATION: 2002 - 2005



## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 01-25/319

PROJECT TITLE: Operation and Maintenance of the Massachusetts Alternative Septic System  
Test Center  
NPS CATEGORY: Land Disposal  
INVESTIGATOR: Barnstable County Dept. of Health and the Environment  
LOCATION: Statewide

#### DESCRIPTION:

This project will continue to operate and maintain the very successful Massachusetts Alternative Septic System Test Center located at the Otis Air National Guard Base on Cape Cod. MASSTC monitors the contaminant removal capabilities of conventional and alternative wastewater treatment systems. This provides a body of verified, comparable data about the effectiveness of these systems, which is disseminated to state regulators and local officials. With this project, the MASSTC seeks to continue its current operation while expanding the program to accept and test as many other new technologies as possible. In addition, the MASSTC is open as a training and educational facility to various groups who wish to observe first-hand the systems that are undergoing evaluation.

Tasks to be completed include:

1. Conducting regular facility operations;
2. Solicitation, testing, research, and development of new on-site technologies;
3. Data analysis and synthesis into report format;
4. Tours and educational outreach for Test Center visitors, including regulators, municipal officials, contractors, realtors, engineers, designers, and others; and
5. General outreach and education including presentations, workshops, and the publication of articles.

PROJECT COST: \$250,273  
FUNDING: \$150,164 by the US EPA  
\$100,109 from Vendors, through the ETV program  
DURATION: 2002 - 2005

## **MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

### **SECTION 319 NONPOINT SOURCE PROJECT 01-26/319**

PROJECT TITLE: Massachusetts Estuaries Project  
INVESTIGATOR: University of Massachusetts-Dartmouth  
LOCATION: Southeastern Coastal Massachusetts

DESCRIPTION: This project will begin to implement the Linked Watershed Embayment Model Approach in 89 coastal estuaries in Southeastern Massachusetts for TMDL development.

Specific tasks include:

1. Develop a Quality Assurance Project Plan;
2. Collect data and implement the Linked watershed-Embayment Approach in 20 embayments;
3. Provide technical assistance and training for municipalities and volunteer groups;
4. Conduct Linked Model training;
5. Conduct public participation; and
6. Report results.

PROJECT COST: \$ 2,172,000

FUNDING: \$ 706,187 from US EPA  
\$ 198,813 from state and local funds  
\$1,267,000 other non-federal match

DURATION: 2002-2008

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 02-01/319

PROJECT TITLE: Indian Lake Watershed Resource Restoration  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: City of Worcester Department of Public Works  
LOCATION: Blackstone Watershed

#### DESCRIPTION:

Indian Lake is the largest body of water located completely within the City of Worcester. The Lake's 2000-acre watershed area is heavily urbanized. Over the past 50 years, development within the Mill Brook watershed has increased dramatically, which has caused water quality problems. Sedimentation and high phosphorus loads have led to eutrophication of the Lake with 303d listed impairment of water quality from low dissolved oxygen, nuisance aquatic plants, and organic enrichment.

This project is part of a comprehensive effort to improve water quality and recreational opportunities at Indian Lake and in the surrounding watershed by treating polluted urban stormwater runoff, which results in sedimentation and nutrient inputs to the Lake and its tributaries. Structural Best Management Practices (BMPs) will be installed to remove sediment and nutrients from stormwater entering the Lake, while public outreach and education will help to reduce watershed contaminants at the source.

#### Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-construction water quality monitoring to document project results;
3. Design and installation of a series of structural Best Management Practices (BMPs) to prevent contaminated runoff from reaching the Lake;
4. Conducting minor repairs to the impoundment dam;
5. Implementation of a long-term weed control plan;
6. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs; and
7. Outreach and education to stakeholders.

PROJECT COST: \$ 437,900

FUNDING: \$ 253,000 by the US EPA  
\$ 3,000 City of Worcester Department of Public Health  
\$ 103,060 City of Worcester Department of Public Works  
\$ 6,400 City of Worcester Parks, Recreation and Cemetery Department  
\$ 57,290 Indian Lake Watershed Association  
\$ 1,500 Morgan Construction/Norton Co.  
\$ 1,000 Regional Environmental Council  
\$ 5,000 Tighe and Bond  
\$ 5,150 Worcester Polytechnic Institute

DURATION: 2003 - 2006

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 02-02/319

PROJECT TITLE: Wall Street Highway Yard Stormwater Improvements Project  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: City of Attleboro  
LOCATION: Ten Mile Watershed

#### DESCRIPTION:

The City of Attleboro's Wall Street Highway Yard is a 6.6-acre parcel on the banks of the Ten Mile River. There is currently no treatment or buffer for stormwater runoff from the highway facility. The drainage system from the highway yard discharges directly into the River from two outfalls and two overland flow locations. Documented water quality data for similar facilities shows that oil and grease, automotive fluids, sediment, metals, nutrients, and toxic chemicals are among the nonpoint source pollutants likely to be found in runoff from the site. The site directly abuts the Ten Mile River, which is 303d listed for toxicity, metals, nutrients, organic enrichment/low dissolved oxygen, and pathogens.

The goal of this project is to improve water quality and the physical and biological health of the riparian corridor at this site by implementing structural and non-structural Best Management Practices to reduce non-point source pollution entering the Ten Mile River from this location.

#### Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-construction water quality monitoring to document project results;
3. Work at several locations to implement installation of six new storm drain inlet catch basins;
4. Construction of a bioretention facility and swale;
5. Improved overland drainage into infiltration systems;
6. Installation of vegetated riparian buffers;
7. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs; and
8. Education of facility users about BMPs to be used on-site.

PROJECT COST: \$260,825

FUNDING: \$155,975 by the US EPA  
\$104,850 by the City of Attleboro

DURATION: 2003 - 2006

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 02-03/319

PROJECT TITLE: Stormwater Management on the Middle Pond of the Congamond Lakes  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Pioneer Valley Planning Commission  
LOCATION: Westfield Watershed

#### DESCRIPTION:

The Congamond Lakes are three interconnected ponds: North, Middle, and South Ponds. Together, the three ponds are approximately three miles long and up to one-third of a mile wide, with a total surface area of 465 acres. The Congamond Lakes are 303d listed for noxious aquatic plants. The Lakes are heavily used for recreational purposes, and the eutrophication of the Lakes has become a deterrent to recreation as well as a potential health hazard.

The purpose of this project is to address the quality of street runoff entering Middle Pond of the Congamond Lakes from the Berkshire Avenue Sub-basin drainage area. A diagnostic/feasibility study conducted in 1983 recommended stormwater management measures, including structural Best Management Practices as well as watershed controls for source reduction of pollutants.

#### Project tasks include

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-construction water quality monitoring to document project results;
3. Design and construction of a detention basin with a water quality swale;
4. Removal of accumulated in-lake sediment;
5. Development of stormwater control bylaws;
6. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs; and
7. On-site technical assistance for watershed residents.

PROJECT COST: \$ 155,435

FUNDING: \$ 92,935 by the US EPA  
\$ 62,500 by the Town of Southwick

DURATION: 2003 - 2006

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 02-04/319

PROJECT TITLE: Implementing Nonpoint Source BMPs at Richmond Pond  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Town of Richmond/Richmond Pond Association  
LOCATION: Housatonic Watershed

#### DESCRIPTION:

Richmond Pond is a 218-acre water body that is listed as impaired by noxious aquatic plants (invasives) in the 1997 DEP water quality assessment report. The Pond is heavily used for recreation by residents and by several camps. The heavy weed growth impairs swimming and boating on the Pond. Results of a 1990 Diagnostic/Feasibility study indicate that the installation of structural and non-structural dirt road best management practices, installation of buffers along shoreline and tributary corridors, and installation of detention basins at tributary inlets will improve water quality in Richmond Pond, thus helping to control weed growth.

Project goals include implementation of watershed and in-lake BMPs to mitigate NPS, restoration and protection of recreational uses and habitat value, and implementation of D/F recommendations for the elimination and control of invasive aquatics. This project will also implement recommendations from a stormwater assessment report, 99-10/MWI, to address stormwater and erosion around the lake.

#### Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-construction water quality monitoring to document project results;
3. Design and install a detention pond;
4. Drainage improvements;
5. Installation of vegetative buffers;
6. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs; and
7. Education and outreach work, which will feature brochures and training workshops for watershed residents about buffer design and installation.

PROJECT COST: \$ 92,000

FUNDING: \$ 55,200 by the US EPA  
\$ 36,800 by the Town of Richmond

DURATION: 2003 – 2006

# MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

## SECTION 319 NPS PROJECT 02-05/319

PROJECT TITLE: Neponset River Watershed Bacteria TMDL Implementation Project  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Neponset River Watershed Association  
LOCATION: Boston Harbor/Neponset Watershed

### DESCRIPTION:

Much of the Neponset River and many of its tributaries fall short of their designated uses for primary and secondary contact recreation due to bacterial pollution. Many point sources of bacterial pollution have been identified and addressed by DEP and NepRWA in the past decade, but mainstem bacteria problems persist. Many tributaries are also included on the 303 d list for other impairments including sedimentation, toxicity, aesthetics, habitat degradation, and temperature. A draft TMDL has been developed for bacteria in the Neponset River. This project seeks to comprehensively implement the recommendations of the draft TMDL, with the goal of abating the worst sources of NPS bacterial pollution and restoring designated uses of the Neponset River.

The project focuses on four major strategies: managing residential stormwater runoff, ensuring proper maintenance of septic systems, detailing sources of NPS bacteria as called for in the TMDL, and a strong outreach and technology transfer component. Project success will be gauged through water quality monitoring, and ultimately by the number of stream segments restored to their designated uses.

### Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-implementation water quality monitoring to document project results;
3. Design and installation of structural BMPs (enhanced wetland, phyto-enhanced buffer, bioretention cells) on Pine Tree Brook;
4. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs; and
5. Outreach and education about watershed BMPs and proper septic maintenance.

PROJECT COST: \$ 472,152

FUNDING: \$ 283,005 by the US EPA  
\$ 40,577 by the Neponset River Watershed Association  
\$ 116,654 by the Town of Milton  
\$ 31,915 by the Town of Walpole

DURATION: 2003 - 2006

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 02-06/319

PROJECT TITLE: Head of Westport Stormwater Project  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Town of Westport  
LOCATION: Buzzards Bay Watershed

#### DESCRIPTION:

In the Town of Westport, the Westport River has 35 miles of shoreline and drains approximately 85% of the town's land area. The river supports an extensive and productive estuarine habitat including over 1000 acres of salt marsh vegetation. Within the estuary, there are approximately 3000 acres of shellfish beds. Two branches of the River, the East Branch and the West Branch, converge at Westport Point to form a single discharge into Buzzards Bay. The tidal component of the East Branch extends from the area known as the Head of Westport to the mouth of the river. The watershed of the East Branch is the larger of the two branches and consists primarily of agricultural and residential land use in the lower region, and forest in the upper part. Currently, the East Branch of the Westport River from Lake Noquochoke to the West branch is 303d listed for pathogens. This bacterial contamination threatens the health of the shellfish beds located within the watershed, causing restrictions on harvesting.

The goal of the project is to improve water quality in the East Branch by reducing nonpoint source pollution at the Head of Westport through implementation of a combination of structural stormwater control Best Management Practices to remove bacteria from the first flush of stormwater, and public outreach and education to watershed stakeholders.

#### Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-construction water quality monitoring to document project results;
3. Construction of a sediment forebay for pretreatment of stormwater runoff before discharge into two retention ponds;
4. Construction of a sediment basin to discharge into a constructed wetland;
5. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs; and
6. Outreach and education to watershed stakeholders in collaboration with the Buzzards Bay Program.

PROJECT COST: \$ 444,144

FUNDING: \$ 264,332 by the US EPA  
\$ 160,441 by the Town of Westport  
\$ 19,371 by the Westport River Watershed Alliance

DURATION: 2003 – 2006



# MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

## SECTION 319 NPS PROJECT 02-07/319

PROJECT TITLE: Lake Singletary Storm Drain Retrofit Program  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Town of Millbury  
LOCATION: Blackstone Watershed

### DESCRIPTION:

Lake Singletary lies in the towns of Millbury and Sutton. The Lake shows signs of eutrophication, including periodic algae blooms, reduced transparency, and infestation of nuisance aquatic plants. The degraded condition of the Lake impairs recreational and aesthetic values of Lake Singletary. A Diagnostic/Feasibility study and a lake management plan have been completed, with a recommendation that phosphorus loads to the lake must be reduced to slow the eutrophication process. Management options proposed in the lake management plan include stormwater management to reduce sedimentation and nutrient loading.

The Town of Millbury will coordinate with the Town of Sutton and the Lake Singletary Watershed Association to implement BMPs by retrofitting 20 existing stormwater structures and enhancing three wet detention swales and catch basins. Outreach and education will be undertaken by the LSWA, who will carry out such projects as storm drain stenciling, maintaining a web site, and producing a video for local cable access television.

### Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-construction water quality monitoring to document project results;
3. Retrofit of 20 existing catch basins;
4. Repair and enhancement of three wet detention swales and catchment areas;
5. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs; and
6. Outreach and education to watershed stakeholders about nonpoint source pollution and water quality issues.

PROJECT COST: \$ 134,329

FUNDING: \$ 70,907 by the US EPA  
\$ 53,022 by the Towns of Millbury and Sutton  
\$ 10,000 by the Lake Singletary Watershed Association  
\$ 400 by the Boy Scouts of America

DURATION: 2003 - 2006

# MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

## SECTION 319 NPS PROJECT 02-08/319

PROJECT TITLE: Hammond Pond Stormwater Management Plan Implementation Phase I  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: City of Newton  
LOCATION: Charles Watershed

### DESCRIPTION:

Hammond Pond is a shallow 22-acre freshwater kettle pond. Its watershed is approximately 167 acres, located in Newton and Brookline. Dominant land use of the watershed (38%, 64 acres) is commercial. The Pond is widely used for recreational and aesthetic purposes including catch and release fishing, bird watching, and canoeing. Hammond Pond is experiencing accelerated eutrophication and bacterial contamination, and is 303d listed for noxious aquatic plants. 71% of the Pond's inflow is from rainwater. Stormwater runoff and direct contamination by large numbers of waterfowl are regarded as the primary causes of the impairments.

This project proposes implementation of several high-priority projects that are recommended in an overall master plan. The goal is to treat the greatest amount of runoff possible, with the greatest quantifiable pollutant load removal. The proximity of the site to a very large shopping mall, coupled with the heavy recreational use of the Pond, will maximize the opportunity for outreach and education to stakeholders, as well as the visibility and technology transfer of the Best Management Practices that will be used.

### Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-construction water quality monitoring to document project results;
3. Design, permitting, and installation of Phase I BMPs (bioretention facilities, sand filter, Vortechs unit, buffers, forebay, paving modification)
4. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs; and
5. Outreach and education to stakeholders about waterfowl feeding and other NPS problems.

PROJECT COST: \$ 249,257

FUNDING: \$ 149,500 by the US EPA  
\$ 74,075 by the City of Newton  
\$ 12,160 by the Friends of Hammond Pond  
\$ 500 by the Chestnut Hill Village Alliance  
\$ 1,000 by the Charles River Neighborhood Foundation  
\$ 6,022 by the Charles River Watershed Association  
\$ 6,000 by the Chestnut Hill Garden Club

DURATION: 2003 - 2006

# MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

## SECTION 319 NPS PROJECT 02-09/319

PROJECT TITLE: Stormwater Remediation for Plymouth Harbor and Plymouth Bay  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Town of Plymouth Department of Public Works/Engineering  
LOCATION: South Coastal Watershed

### DESCRIPTION:

Plymouth Harbor is listed on the 303(d) list of impaired waters due to bacterial contamination from stormwater runoff. This bacterial contamination has caused beach closures in the Harbor and has contributed to the prohibition of shellfishing in Plymouth Harbor and Plymouth Bay. The Town of Plymouth is undertaking a comprehensive, three-phase program to address bacterial pollution in the area. The first two phases, which are fully funded and underway, are the expansion and improvement of the Plymouth Wastewater Treatment Plant and a new Plymouth Harbor Pump-Out Program. The Pump-Out Program provides a pump-out boat that services recreational vessels in the Harbor, and provides a shoreside pump-out facility that can accommodate larger commercial boats and the residential fleet.

This project will fund and implement the third phase of the Town's comprehensive clean-up program. It addresses the impacts of non-point source pollution due to stormwater runoff from the watershed. A substantial amount of study has already been completed by the Town to determine the most appropriate approach to this phase of the work. Three Best Management Practices (BMPs) will be designed and installed in locations that have been selected to provide the maximum amount of remediation. These BMPs will be infiltration stormwater treatment devices for removal of bacteria. Pre-and post-implementation water quality monitoring will be conducted in accordance with a Quality Assurance Project Plan in order to measure and document project success. Development and implementation of an Operation and Maintenance Plan will ensure that the BMPs continue to function properly. The Town will promote outreach and education about this project through a variety of activities including press releases, local events, and through the Town's web site.

### Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-construction water quality monitoring to document project results;
3. Final design and installation of stormwater BMPs in three locations;
4. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs; and
5. Outreach and education about the project.

PROJECT COST: \$ 435,000

FUNDING: \$ 249,000 by the US EPA  
\$ 186,000 by Town of Plymouth

DURATION: 2003 - 2006

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**SECTION 319 NPS PROJECT 02-10/319**

PROJECT TITLE: Implementation of TMDL Recommendations at Lake Boon  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Lake Boon Commission (Town of Stow)  
LOCATION: SuAsCo Watershed

**DESCRIPTION:**

Lake Boon is a 163-acre great pond located in the towns of Stow and Hudson. The Town of Stow will administer this contract on behalf of the Towns of Stow and Hudson and the Lake Boon Commission. The 1000-acre watershed is a mix of forest and residential development, with many lakefront cottages that been converted into year-round homes. The Lake is divided into four basins, the first and largest of which is largely natural. The remaining three basins are man-made as a result of damming of the outlet pond in the mid 1800's. The second, third and fourth basins are overgrown with invasive weeds that have spread considerably in the last decade. Lake Boon is 303d listed for nuisance aquatic plants, and a TMDL for phosphorus is in the final draft stages.

Activities proposed have been recommended in at least one of three studies that have been completed for the Lake. The project goal is to improve water quality in the Lake through installation of structural stormwater treatment devices, and to reduce non-point source pollution at the source by encouraging good practices among watershed residents and stakeholders. An aquatic plant replacement program will also be conducted.

**Project tasks include:**

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-construction water quality monitoring to document project results;
3. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs;
4. Conducting a lake watershed survey;
5. Installation of 26 stormwater BMPs (leaching catch basins);
6. Development and implementation of a septic pumping reminder program;
7. A plant replacement program; and
8. Educational brochures and outreach to stakeholders.

PROJECT COST: \$ 143,214

FUNDING: \$ 84,692 by the US EPA  
\$ 49,322 by the Towns of Stow and Hudson  
\$ 1,200 from the Lake Boon Commission  
\$ 8,000 from the Lake Boon Improvement Association

DURATION: 2003 - 2006

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 02-11/319

PROJECT TITLE: Wachusett Mountain NPS Pollution Management  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Wachusett Mountain Associates (WMA)  
LOCATION: Nashua Watershed

#### DESCRIPTION:

Wachusett Mountain State Reservation is home to a number of water resources including intermittent and perennial streams, ponds, vernal pools, and wetlands. The condition of Wyman Pond, a 200-acre lake in the 4C category of the Integrated List ( “impairments not caused by pollutants” ), has been documented over two decades, including a 1983 Diagnostic/Feasibility Study and a 2000 stream and stormwater monitoring and evaluation program. Excessive sediment (TSS) has been identified as one of the main water quality concerns for Wyman Pond.

This project will build upon an existing stormwater management system by installing a number of BMPs that will significantly reduce or eliminate future degradation of the receiving waters and downstream resource areas, as well as provide an opportunity to educate a large number of guests that visit this Wachusett Mountain Ski Area. Runoff from a portion of the five-acre parking lot receives minimal treatment before it is discharged to a resource area. In order to bring the stormwater management system into compliance with Massachusetts Stormwater Standards, WMA proposes to install a series of BMPs that will reduce TSS below the recommended 80% levels as well as increase groundwater recharge at the site. BMPs to be installed include a grit separator, stormwater filtration, and an infiltration gallery.

#### Project tasks include:

1. Development and implementation of a Quality Assurance Project Plan;
2. Installation of a series of structural BMPs to control and treat stormwater flow;
3. Development and implementation of an Operation and Maintenance Plan;
4. Construction of educational kiosks for outreach and education about NPS issues; and
5. Watershed BMPs to reduce the amount of sediment entering the system.

PROJECT COST: \$ 161,000

FUNDING: \$ 97,000 by the US EPA  
\$ 64,000 by Wachusett Mountain Associates

DURATION: 2004 - 2007

# MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

## SECTION 319 NPS PROJECT 03-01/319

PROJECT TITLE: Operation and Maintenance of the Massachusetts Alternative Septic System  
Test Center  
NPS CATEGORY: Land Disposal  
INVESTIGATOR: Barnstable County Dept. of Health and the Environment  
LOCATION: Statewide

### DESCRIPTION:

This project will continue to operate and maintain the very successful Massachusetts Alternative Septic System Test Center located at the Otis Air National Guard Base on Cape Cod. MASSTC monitors the contaminant removal capabilities of conventional and alternative wastewater treatment systems. This provides a body of verified, comparable data about the effectiveness of these systems, which is disseminated to state regulators and local officials. With this project, the MASSTC seeks to continue its current operation while expanding the program to accept and test as many other new technologies as possible. In addition, the MASSTC is open as a training and educational facility to various groups who wish to observe first-hand the systems that are undergoing evaluation.

This continuing project endeavors to support the state's developing TMDL program by providing environmental decision makers with the tools by which the goals of the TMDL program can be achieved, especially where wastewater is a major source of pollutant loading. The project proposes to continue the ongoing work of the MASSTC. Tasks include conducting facility operations, synthesizing data derived from testing of new systems, reporting on test results, and providing outreach and education at the test center and through published reports and articles.

Tasks to be completed include:

1. Conducting regular facility operations;
2. Solicitation, testing, research, and development of new on-site technologies;
3. Data analysis and synthesis into report format;
4. Tours and educational outreach for Test Center visitors, including regulators, municipal officials, contractors, realtors, engineers, designers, and others; and
5. General outreach and education including presentations, workshops, and the publication of articles.

PROJECT COST: \$ 206,731

FUNDING: \$ 124,005 by the US EPA  
\$ 34,226 by the Barnstable County Dept. of Health and the Environment  
\$ 48,500 by technology vendors (ETV program of the US EPA)

DURATION: 2003 - 2006

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 03-02/319

PROJECT TITLE: Comparison Of Virus Removal In Aggregate Free Chamber Leaching Systems vs.  
Aggregate Laden Trenches  
NPS CATEGORY: Land Disposal  
INVESTIGATOR: Barnstable County Dept. of Health and the Environment  
LOCATION: Statewide

#### DESCRIPTION:

In recent years, the Commonwealth of Massachusetts has been petitioned by vendors of chamber-type leaching structures to reduce the required area for soil absorption when their product is used without aggregate. Regulators at the state level are concerned that the higher loading rates of such a system might reduce the virus removal capability as compared to standard aggregate-laden trenches.

The goal of the proposed project is to determine whether aggregate-free leaching systems challenged with the requested loading rates provide the same degree of pathogen removal as aggregate-laden leaching trenches loaded at the rates prescribed in Title 5.

Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Design and construction of test systems;
3. Monitoring to document project results; and
4. Technology transfer of results through publication of articles, presentation, and two workshops.

PROJECT COST: \$ 39,159

FUNDING: \$ 23,359 by the US EPA  
\$ 15,800 to be determined

DURATION: 2003 - 2006

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 03-03/319

PROJECT TITLE: South Coastal Inter-Municipal Water Quality Improvement Project  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Town of Pembroke  
LOCATION: South Coastal, Taunton Watersheds

#### DESCRIPTION:

This project is part of a multi-community effort to work collectively in reducing stormwater contaminants from entering fifteen 303d-listed waterbodies in the towns of Pembroke, Hanover, and Hanson. Pembroke is the lead applicant for this cooperative proposal. In 2001, the towns of Pembroke and Hanson jointly purchased a weed harvester, and in 2000 the same towns jointly applied for and received a CZM/CPR grant to install several BMPs for the Indian Head River.

The principal activity of this project will be to purchase and share a Johnston 605 PM-10 vacuum street sweeper to remove roadside sediment, nutrients, toxics, and other pollutants that currently enter stormwater infrastructure. A strategic Pavement Cleaning program will be developed to target the 15 303d-listed waterbodies within the boundaries of the three towns. Storm drain markers, signage, and an intensive public education and outreach program will also be implemented under this proposal.

#### Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Purchase and operation of the Johnston 605 PM-10 Vacuum Sweeper;
3. Finalization of an intermunicipal agreement for shared operation of the equipment;
4. Development and implementation of a Pavement Cleaning Program to ensure maximum efficiency of the program;
5. Development and implementation of a public outreach and education program  
For stakeholders;
6. Water quality monitoring to document project results; and
7. Technology transfer with regard to the effectiveness of the pavement cleaning program.

PROJECT COST: \$ 356,910

FUNDING: \$ 211,212 by the US EPA  
\$ 186,000 by the Towns of Pembroke, Hanover, and Hanson

DURATION: 2003 - 2006



# MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

## SECTION 319 NPS PROJECT 03-04/319

PROJECT TITLE: Dorothy Pond Perimeter and Local Watershed Stormwater Management/Remediation Proposal  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Town of Millbury  
LOCATION: Blackstone Watershed

### DESCRIPTION:

Dorothy Pond is an enhanced great pond, approximately 160 acres in size. It is fed by Broadmeadow Brook, with a watershed in the northeast quadrant of Millbury. The Pond is adversely impacted by urban and residential development on the shoreline and in its watershed. Nutrients and sedimentation have caused the Pond to become eutrophic with significant annual growth of nuisance aquatic vegetation. Water quality sampling has demonstrated that nutrient loads and siltation increase significantly during storm events.

The goal of the project is to improve the management of stormwater runoff and thereby reduce the nutrient loading, turbidity, and siltation/sedimentation caused by stormwater entering the Pond. A Diagnostic/Feasibility study and a TMDL analysis for phosphorus have been completed for the Pond, and project activities follow the recommendations of those reports. Tasks include design and installation of twenty Stormceptor-type units to be installed at every storm drain outlet entering Dorothy Pond and other Millbury outlets that empty into Broadmeadow Brook, and outreach/education through activities of the Dorothy Pond Watershed Association, Massachusetts Audubon Society, and others.

### Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-construction water quality monitoring to document project results;
3. Design and installation of twenty Stormceptor or similar units;
4. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs; and
5. Public outreach and education for watershed stakeholders.

PROJECT COST: \$ 189,000

FUNDING: \$ 113,400 by the US EPA  
\$ 75,600 by Town of Millbury

DURATION: 2003 - 2006

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**SECTION 319 NPS PROJECT 03-05/319**

PROJECT TITLE: Bare Hill Pond Noxious Aquatic Plant Reduction  
NPS CATEGORY: Resource Restoration  
INVESTIGATOR: Town of Harvard  
LOCATION: Nashua

**DESCRIPTION:**

Bare Hill Pond in Harvard, Massachusetts is a 321- acre municipally managed pond in the Nashua basin. The watershed is moderately developed, although it maintains the rural nature of the community due to largely forested environs. The pond has elevated nutrient levels and suffers from extensive growths of invasive plants including variable milfoil, water chestnut, water lilies, fanwort, smartweed, and pondweed. The excessive weed growth is attributable to shallow water depth, nutrient rich bottom sediments, and sustained nutrient input from the watershed.

This project will address recommendations made in the Bare Hill Pond TMDL by reducing the biomass of noxious aquatic plants through monitored winter drawdowns and harvesting, and will reduce the levels of phosphorus through outreach and education. It proposes to provide an interesting tool that may be useful to other waterbodies in the Commonwealth. The town routinely addresses invasive aquatic species through an annual drawdown. The drawdown is limited to a four-foot depth because of the physical constraints of the dam. This project proposes to develop a floating mounted pump that will enable the grantees to implement a deeper drawdown, thus enabling better weed control.

**Project tasks include:**

1. Development and implementation of a Quality Assurance Project Plan;
2. Develop a mobile pumping station to facilitate drawdowns;
3. Drawdowns, weed harvesting and manual weed pulling to reduce macrophytes;
4. A NPS survey of the lake watershed; and
5. Development of a community outreach and education program to improve watershed management and reduce phosphorus inputs.

PROJECT COST: \$ 329,850

FUNDING: \$ 195,000 by the US EPA  
\$ 134,850 by the Town of Harvard and its Bare Hill Pond Watershed Management Committee

DURATION: 2004 - 2007

# MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

## SECTION 319 NPS PROJECT 03-06/319

PROJECT TITLE: Pittsfield Water Supply: Stormwater Remediation Project  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: City of Pittsfield  
LOCATION: Housatonic Watershed

### DESCRIPTION:

The City of Pittsfield maintains and operates six surface water supply sources and two water treatment facilities for their drinking water supply. Both the Cleveland and the Sackett Brook reservoirs are threatened by stormwater runoff from adjacent roadways. At Cleveland Reservoir, approximately 4462 feet of roadway lies within Zone A, some of which is unpaved and all of which directs sheet flow directly into the reservoir. At Sackett Brook Reservoir, two roads hug the shoreline for 3103 feet within the Zone A. The eastern side of the roadway is bounded by steep upward slopes, forcing untreated stormwater to run into the reservoir.

This project seeks to remediate stormwater runoff to these two surface water supplies, as recommended in the DEP SWAP report and the BRPC Draft Pittsfield Watershed Plan. Stormwater BMPs will be designed and installed to mitigate roadway runoff. In addition, the project will initiate outreach to City residents regarding the NPDES Phase II stormwater management plan and the impacts of nonpoint source pollution. The volume of sediment entering into the reservoirs is unknown at this time, although sedimentation problems are evident upon visual inspection. The project will develop a method for measuring the volume of sediment prevented from entering the surface water supplies based on mitigation of current roadway conditions through the implementation of stormwater BMPs. The stormwater BMPs will be designed to meet the 80% TSS removal requirement of the MA Stormwater Management Policy.

### Project tasks include:

1. Development and implementation of a Quality Assurance Project Plan (QAPP);
2. Final designs, permits, and installation of three BMPs;
3. Development and implementation of an Operation and Maintenance Plan for the BMPs; and
4. Outreach and education about the project.

PROJECT COST: \$ 105,900

FUNDING: \$ 63,540 by the US EPA  
\$ 42,360 by the City of Pittsfield

DURATION: 2004 - 2007

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**SECTION 319 NPS PROJECT 03-07/319**

PROJECT TITLE: Connecticut River Watershed Restoration Phase III  
NPS CATEGORY: Resource Restoration  
INVESTIGATOR: Franklin Regional Council of Governments  
LOCATION: Connecticut Watershed

**DESCRIPTION:**

Federal and state agencies and watershed groups have identified bank erosion in the 22-mile reach of the Connecticut River known as the Turners Falls Power Pool as a significant source of nonpoint source pollution. Severe bank erosion is contributing sediment to an important anadromous and freshwater fisheries habitat and is also responsible for the loss of prime agricultural cropland and the degradation of riparian habitat used by rare species of dragonflies, bald eagles, migratory birds, and other wildlife. Two previous 319 grants introduced several different bioengineering techniques for riverbank restoration at four priority sites in this reach.

The objectives of this proposal include continuation of this innovative work at another priority site; continued monitoring of the restored sites to evaluate their long-term effectiveness and maintenance requirement; and expanding the technology transfer component of the ongoing work. The technology transfer work will focus on resource and regulatory agency personnel and design professionals who may be interested in learning about and applying similar techniques at other locations.

Project tasks include:

1. Development and implementation of a Quality Assurance Project Plan for continuous monitoring of sites previously repaired as well as sites to be repaired in this phase of the work;
2. Repair of approximately 1600 linear feet of eroded riverbank;
3. Technical support to the Connecticut River Streambank Erosion Committee; and
4. Technology transfer to private sector professionals as well as local, state, and federal agency personnel.

PROJECT COST: \$ 642,196

FUNDING: \$ 270,716 by the US EPA  
\$ 371,480 by Northeast Generation Services

DURATION: 2004 - 2007

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**SECTION 319 NPS PROJECT 03-08/319**

PROJECT TITLE: Powow River Stormwater Management Program  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Town of Amesbury  
LOCATION: Merrimack Watershed

**DESCRIPTION:**

The section of the Powow River running through Amesbury is a popular recreational resource for town residents. Boating, water skiing, fishing and swimming are all common recreation activities performed on the river. Water quality has been a problem for several years with suspended solids, aquatic weed growth, and pathogens predominating causing impairment, resulting in a Category 5 listing for the waterbody. Previous studies have identified stormwater as a likely contributor to water quality problems in the river. Based on recommendations from these reports, several areas along the river and associated tributaries have been selected for installing stormwater best management practices.

Anticipated pollutant load removal for this project is 10,187 lbs. of sediment (TSS) per year and 91lbs. of phosphorus per year. BMPs will consist of 3 narrow baffled tanks, 6 leaching catch basins, and 7 deep sump leaching catch basins. Outreach and education will reduce NPS in the watershed.

**Project tasks include:**

1. Development and implementation of a Quality Assurance Project Plan (QAPP);
2. Final designs, permits, and installation of BMPs;
3. Development and implementation of an Operation and Maintenance Plan for the BMPs;
4. A storm drain stenciling program;
5. Modification of local bylaws for erosion and sedimentation controls; and
6. Outreach and education to further reduce NPS in the watershed.

PROJECT COST: \$ 224,100

FUNDING: \$ 124,720 by the US EPA  
\$ 99,380 by the Town of Amesbury

DURATION: 2004 - 2007

# MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

## SECTION 319 NPS PROJECT 03-09/319

PROJECT TITLE: Clark and Cobbs Pond Stormwater Management Program  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Town of Walpole  
LOCATION: Neponset Watershed

### DESCRIPTION:

Clark and Cobbs Ponds are popular recreational resources for town residents in Walpole. Boating, fishing, swimming and water skiing are all popular activities in the ponds. Water quality in the ponds has been a problem for several years with sedimentation, turbidity, and aquatic weed growth predominating and causing Category 5 water quality impairment. Previous studies have identified stormwater as a likely contributor to water quality problems in the ponds. A two-year SRF-funded project to create a Stormwater Management Plan is underway in town. The proposed implementation of Best Management Practices is consistent with the Stormwater Management Plan's ultimate goal of treating and/or reducing stormwater runoff.

Based on recommendations from a previous report, BMPs have been selected to capture and remove pollutants in stormwater runoff that currently discharges into the ponds. The BMPs will consist of four baffled sediment tanks, and eight deep sump/ off-line leaching catch basins with a grassed infiltration strip. Anticipated pollutant load removal from the BMP installation is 6,670 lbs. of sediment (TSS) per year, and 50.3 lbs. of phosphorus per year.

### Project tasks include:

1. Development and implementation of a Quality Assurance Project Plan (QAPP);
2. Final designs, permits, and installation of BMPs;
3. Development and implementation of an Operation and Maintenance Plan for the BMPs;
4. A storm drain stenciling program; and
5. Outreach and education to further reduce NPS in the watershed.

PROJECT COST: \$ 206,720

FUNDING: \$ 123,720 by the US EPA  
\$ 82,308 by the Town of Walpole

DURATION: 2004 - 2007

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**SECTION 319 NPS PROJECT 03-10/319**

PROJECT TITLE: Spy Pond Stormwater Management Program  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Town of Arlington  
LOCATION: Boston Harbor/Mystic Watershed

**DESCRIPTION:**

Spy Pond is a popular recreational resource for town residents in Arlington and Belmont. Boating, fishing, and swimming are all popular activities in the pond. Studies have documented that poor water quality has been a problem for a long time in Spy Pond. Five different studies have concluded that high levels of phosphorus found in the pond, transported by stormwater, have impaired the pond's water quality. Category 5 impairments include sediment, phosphorus, weeds, and turbidity. Based on recommendations from these reports and in order to correct sedimentation problems, BMPs were installed in several areas within the Spy Pond watershed and associated tributaries through a DEM grant in 2001. These BMPs include leaching catch basins, storm drain marking, alum and aeration treatment, and a public education program.

Direct discharge of stormwater runoff from the Route 2 sub-basin still poses a threat to the pond's water quality. This project will install additional BMPs to address the Route 2 discharge. BMPs to be installed include six baffled sediment tanks and sixteen deep sump/leaching catch basins. Anticipated pollutant load removal is 10,070 lbs. of sediment (TSS) per year and 87 lbs. of total phosphorus per year.

**Project tasks include:**

1. Development and implementation of a Quality Assurance Project Plan (QAPP);
2. Final designs, permits, and installation of BMPs;
3. Development and implementation of an Operation and Maintenance Plan for the BMPs;
4. A Storm Drain marking program; and
5. Outreach and education to further reduce NPS in the watershed.

PROJECT COST: \$ 298,100

FUNDING: \$ 177,520 by the US EPA  
\$ 120,580 by the Town of Arlington

DURATION: 2004 - 2007

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 03-11/319

PROJECT TITLE: Billington Sea Stormwater Remediation Project  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Town of Plymouth Engineering Department  
LOCATION: South Coastal Watershed

#### DESCRIPTION:

Billington Sea is a natural 269-acre warmwater kettle pond located southwest of the center of Plymouth. The pond is the headwaters of Town Brook, a 1-1/2 mile long stream that empties into Plymouth Harbor. Town Brook is an anadromous fish run for alewife and blueback herring that migrate upstream each spring to spawn in Billington Sea. The pond serves as an important recreational facility, as its eastern shoreline is part of Morton Park, a 180 acre park and recreation area. In addition, a state boat ramp is located on the eastern shore. The eastern portion of the pond is also within the recharge area of a public water supply well.

The primary objective of this project is to improve the water quality in Billington Sea by mitigating the adverse impacts of stormwater runoff and sedimentation through the implementation of Best Management Practices along Billington Sea Road and Black Cat Road. The project will support draft TMDL implementation efforts by reducing pollutant loadings to Billington Sea, which is listed in Category 5 for noxious aquatic plants and turbidity. In addition, it is anticipated that this stormwater pollution remediation project, coupled with several other pollution remediation projects along Town Brook, will significantly improve water quality in the Billington Sea/Town Brook region. Targeted pollutants include fecal coliform, e. coli, total phosphorus, suspended sediments, and nitrogen. It is anticipated that phosphorus loading will be reduced from 52 lbs/yr to 15.6 lbs/yr, and nitrogen loads from 546.70 lbs/yr to 218.70 lbs/yr. BMPs include deep sump/hooded catch basins followed by infiltration galleys. The project also includes an innovative, intensive outreach and education task, based on the principles of community-based social marketing, to encourage the local use of watershed-friendly landscaping techniques.

#### Project tasks include:

1. Development and implementation of a Quality Assurance Project Plan (QAPP);
2. Final designs, permits, and installation of BMPs;
3. Development and implementation of an Operation and Maintenance Plan for the BMPs; and
4. A Plymouth Greenscapes campaign to encourage the use of landscape-friendly BMPs.

PROJECT COST: \$ 280,292

FUNDING: \$ 167,773 by the US EPA  
\$ 112,519 by the Town of Plymouth

DURATION: 2004 - 2007



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**SECTION 319 NPS PROJECT 03-12/319**

PROJECT TITLE: Stormwater BMPs for Peppermint Brook and Lily Pond  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Cohasset Board of Water Commissioners  
LOCATION: South Coastal Watershed

**DESCRIPTION:**

Lily Pond, representing approximately 90 percent of the drinking water supply for the Town of Cohasset, currently receives a nutrient load from its watershed in excess of that predicted for good water quality. Studies have classified the pond as eutrophic, with reductions in the nutrient budget required to improve water quality and to preserve the integrity of the drinking water supply. Urban land use and uncontrolled street runoff within the Peppermint Brook sub basin of the Lily Pond watershed contribute a disproportionate share of nutrients and other contaminants to the Pond. Stormwater collection systems within these areas provide little if any pollutant attenuation and represent the areas of greatest risk of catastrophic contamination of the pond.

This project will implement BMP stormwater control devices to improve the water quality and protect Lily Pond. BMP designs will utilize structural best management practices, and will incorporate Low Impact Development urban retrofit strategies wherever possible to contain and minimize off-site flows and pollutant loading in these areas. Structural BMP improvement options to be considered will include hooded catch basins, bioretention facilities, rain gardens, roadside swales with biofilters, and spill containment facilities. Anticipated pollutant load removal is 658 kg/year of nitrogen and 22 kg/year of phosphorus.

Project tasks include:

1. Development and implementation of a Quality Assurance Project Plan (QAPP);
2. Final designs, permits, and installation of BMPs;
3. Development and implementation of an Operation and Maintenance Plan for the BMPs; and
4. Outreach and education to further reduce NPS in the watershed.

PROJECT COST: \$ 425,000

FUNDING: \$ 255,000 by the US EPA  
\$ 170,000 by the Cohasset Board of Water Commissioners

DURATION: 2004 – 2007

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**SECTION 319 NPS PROJECT 04-01/319**

PROJECT TITLE: Operation and Maintenance of the Massachusetts Alternative Septic System Test Center  
NPS CATEGORY: Land Disposal  
INVESTIGATOR: Barnstable County Dept. of Health and the Environment  
LOCATION: Statewide

**DESCRIPTION:**

The Massachusetts Septic System Test Center serves as a resource for quality third-party performance information regarding advanced onsite septic system technologies. In addition, the existence of the Test Center promotes the trial of new technologies to reduce nitrogen and phosphorus from wastewater.

This continuing project endeavors to support the state's TMDL program by providing environmental decision makers with the tools by which the goals of the TMDL program can be achieved, especially where wastewater is a major source of pollutant loading. The project proposes to continue the ongoing work of the MASSTC.

**Project tasks include:**

1. Development of a Quality Assurance Project Plan;
2. Conducting facility operations,
3. Synthesizing data derived from testing new systems,
4. Reporting on test results, and
5. Outreach and education through published articles and facility tours.

PROJECT COST: \$ 228,025

FUNDING: \$ 135,775 by the US EPA  
\$ 92,250 by various onsite system vendors

DURATION: 2004 - 2007

# MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

## SECTION 319 NPS PROJECT 04-02/319

PROJECT TITLE: Innovative Stormwater Technology Transfer and Evaluation Project  
NPS CATEGORY: Urban Runoff/Technology Transfer  
INVESTIGATOR: UMass/Amherst  
LOCATION: Statewide

### DESCRIPTION:

Municipalities in Massachusetts are becoming the first line of defense against nonpoint source pollution. To address this ubiquitous environmental problem, communities need cost-effective stormwater pollution control measures that can treat a range of environmental pollutants, including nutrients, pathogens, organic contaminants, and sediment. Municipal officials are also looking for ways to preserve land for other municipal purposes and improve the quality of their environmental resources through open space preservation. Stormwater BMPs that can effectively treat stormwater runoff with limited land area requirements are highly sought after by communities because the technologies support both of these goals.

The goal of this project is to provide technology transfer information about innovative stormwater BMPs to MADEP, conservation commissions, local officials, and other BMP Users. The project will develop a validated source of technical information on stormwater BMPs, provide end users with qualified information to make appropriate technology implementation decisions, and will assist communities to maximize environmental benefits of grant programs by focusing efforts on technologies that have the most promising potential to reach specific water quality objectives.

### Project tasks include:

1. Development of a web-based technology transfer clearinghouse;
2. A critical assessment of stormwater technology user and demonstration needs;
3. Identification and prioritization of available BMP information; and
4. Monitoring to ensure maximum user friendliness.

PROJECT COST: \$ 336,827

FUNDING: \$ 202,096 by the US EPA  
\$ 18,376 by EOEa  
\$ 116,355 by the University of Massachusetts, Amherst

DURATION: 2004 - 2007

## **MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

### **SECTION 319 NPS PROJECT 04-03/319**

**PROJECT TITLE:** Low Impact Development Training and Technical Assistance for Local Decision Makers  
**NPS CATEGORY:** Outreach and Education, Technology Transfer  
**INVESTIGATOR:** North and South Rivers Watershed Association  
**LOCATION:** South Coastal Watershed

#### **DESCRIPTION:**

Low Impact Development (LID) is a site design strategy with a goal of reducing water quality impacts from residential and commercial development. The primary goal of LID methods is to mimic the predevelopment site hydrology by using site design techniques that store, infiltrate, evaporate, and detain runoff. Use of these techniques helps to reduce off site runoff and ensure adequate groundwater recharge. Since every aspect of site development affects the hydrologic response of the site, LID control techniques mainly focus on site hydrology.

Many existing local development rules in Massachusetts's communities do not recognize, allow, or encourage the use of LID tools. In addition, local officials, engineers, developers, and landscape architects are often not fully aware of these techniques that can be utilized to protect natural resources if they are incorporated into local development rules and decision-making processes.

This project will provide direct training and technical assistance to four Southeastern Massachusetts communities (Plymouth, Kingston, Pembroke and Hanover) to promote and implement LID techniques through changes in local regulations and by implementation of direct LID control measures. A conceptual LID design will be developed for each of the four communities.

#### **Project tasks include:**

1. Direct assistance to local officials;
2. A series of training workshops for development decision makers at the local, regional, and state levels;
3. Community based social marketing methods to evaluate the effectiveness of the program; LID case studies and design development; and
4. Pollutant load reduction analysis.

**PROJECT COST:** \$ 126,600

**FUNDING:** \$ 84,550 by the US EPA  
\$ 42,050 by the North and South Rivers Watershed Association

**DURATION:** 2004 - 2007

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**SECTION 319 NPS PROJECT 04-04/319**

PROJECT TITLE: Upper Charles River Watershed Total Maximum Daily Load  
NPS CATEGORY: Resource Restoration  
INVESTIGATOR: Charles River Watershed Association  
LOCATION: Charles Watershed

**DESCRIPTION:**

In 1995, the EPA launched an effort to restore the Charles River, with a goal of a fishable and swimmable river by Earth Day 2005. Since then, combined sewer overflows have been reduced or eliminated, and over one million gallons per day of raw sewage have been stopped from discharging into the river. Nevertheless, high phosphorus levels remain as a major water quality impairment in the Charles River. This project represents Phase III of a multi-year effort to develop a phosphorus TMDL for the Charles River.

The phosphorus TMDL will be completed, and CRWA will assist with development of a Watershed-Based Plan to support and begin implementation of the TMDL. The project will be evaluated on the timely completion of the tasks, including development of the TMDL and its acceptance by DEP and EPA. A DEP- and EPA-approved Quality Assurance Project Plan will be developed and implemented for monitoring work.

Project tasks include:

1. Development and implementation of a Quality Assurance Project Plan (QAPP);
2. Water quality monitoring;
3. An aquatic plant survey;
4. Flow monitoring;
5. Modeling;
6. Assistance with development of a TMDL and Watershed-Based Plan; and
7. Project Evaluation.

PROJECT COST: \$426,067

FUNDING: \$ 235,440 by the U.S. EPA  
\$ 190,627 by Charles River Watershed Association

DURATION: 2005 – 2008

# MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

## SECTION 319 NPS PROJECT 04-05/319

PROJECT TITLE: Phosphorus and Sediment Load Reduction at Quaboag and Quacumquasit Ponds  
NPS CATEGORY: Resource Restoration  
INVESTIGATOR: Town of Brookfield  
LOCATION: Chicopee Watershed

### DESCRIPTION:

Quaboag and Quacumquasit Ponds are two of the most highly prized and intensely utilized waterbodies in the state. Quaboag is a relatively shallow (average 6 feet deep) waterbody of 560 acres, located within a drainage area almost 100 times its surface area. It is listed as a Category 5 waterbody, requiring a TMDL for phosphorus. A TMDL is being prepared by the Department and is anticipated to be available in early 2005. Quacumquasit is an adjacent deeper, smaller (220 acres) waterbody that has also been shown in a 1986 Diagnostic/Feasibility study to have excessively high levels of phosphorus.

The goal of this project is to support the TMDL development and implementation by prioritizing and addressing pollutant sources within the shared watershed of the two lakes. Some implementation work that has been previously recommended will be undertaken, and plans will be developed for future implementation that will further reduce the NPS coming into the lakes. Targeted pollutants are nutrients and TSS. The project will be evaluated through development and implementation of a DEP- and EPA-approved Quality Assurance Project Plan (QAPP).

Project tasks include:

1. Development and implementation of a Quality Assurance Project Plan (QAPP);
2. Prioritization of pollutant sources;
3. Development of conceptual plans for two or more high-priority BMPs;
4. Evaluation of additional control measures, including the backflow between the two lakes; and
5. Aquatic vegetation management.

PROJECT COST: \$ 270,833

FUNDING: \$ 162,500 by the U.S. EPA  
\$ 88,933 by the Quaboag/Quacumquasit Lake Association  
\$ 10,000 by the ESS Group, Inc.  
\$ 9,400 by the Town of Brookfield

DURATION: 2005 - 2008

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 04-06/319

PROJECT TITLE: Enhancing Implementation of Nutrient Management on Massachusetts Crop/Livestock Farms  
NPS CATEGORY: Outreach/Education  
INVESTIGATOR: UMass/Amherst  
LOCATION: Statewide

#### DESCRIPTION:

Animal agriculture remains a major threat to the environment through nonpoint source pollution from manure and cropping practices. The main focus of nutrient management planning in Massachusetts has been to reduce the threat from dairy farms. While the dairy industry has the greatest cash receipts and is still the largest holder of open space among the livestock groups, all livestock are important local economic contributors to the Massachusetts economy. This project will continue ongoing work to develop nutrient management plans for livestock operations, with a special focus on equine operations. The sizeable equine industry has often been overlooked as a major livestock group. Many horse owners, like other livestock owners, are not well versed in agriculture and nutrient management practices, and their keeping of animals is often a concern to towns and communities.

The goal of the project is to address nutrient concerns from livestock to reduce the risk of nonpoint source pollution through outreach and educational activities with full and part-time livestock farmers and with service providers who interact with the various livestock groups. The project will be evaluated on the timely completion of the tasks and the number of nutrient management plans that are developed and implemented as a result of this project.

#### Project tasks include:

1. Coordination with an inter-agency and farmer advisory committee;
2. Educational workshops and meetings for farmers
3. Training for public and private sector service providers and certified planners;
4. Evaluation and improvement of current nutrient management planning process;
5. Implementation of farm nutrient management plans; and
6. On-farm demonstrations.

PROJECT COST: \$179,388

FUNDING: \$ 99,360 by the U.S. EPA  
\$ 80,028 by UMass/Amherst

DURATION: 2005 - 2008

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**SECTION 319 NPS PROJECT 04-07/319**

PROJECT TITLE: Stormwater BMP Implementation for Route 28 to Bass River Subwatershed  
NPS CATEGORY: Resource Restoration  
INVESTIGATOR: Town of Yarmouth  
LOCATION: South Coastal Watershed

**DESCRIPTION:**

The Bass River is an important recreational and economic resource for the towns of Yarmouth and Dennis. Testing and studies have determined that Route 28 road runoff is the highest priority source of contamination of the shellfish beds and general water quality of the Bass River.

This project implements stormwater BMPs under an urban retrofit strategy within a 10-acre drainage area that is tributary to the Bass River at the Route 28 outfall. Four drainage interception and diversion systems are proposed for construction along the half-mile stretch of Rte. 28 in this section. The goal of the project is to improve water quality in the Bass River by treating and infiltrating stormwater runoff from Route 28. BMPs will include hooded catch basins, first flush flow diversion, water quality inlet tanks, and recharge chamber systems. Pollutants of concern include sediment and nutrients. The project will be evaluated through development and implementation of a DEP- and EPA-approved QAPP.

**Project tasks include:**

1. Development and implementation of a Quality Assurance Project Plan (QAPP);
2. Design, permitting, and installation of BMPs;
3. Development of an Operation and Maintenance Plan for the BMPs; and
4. Public outreach and education.

PROJECT COST: \$295,000

FUNDING: \$ 174,400 by the U.S. EPA  
\$ 36,400 by MassHighway  
\$ 84,200 by the Town of Yarmouth

DURATION: 2005 - 2008



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**SECTION 319 NPS PROJECT 04-09/319**

PROJECT TITLE: Stormwater Management Retrofits for the Samoset Street Outfall to Plymouth Harbor  
NPS CATEGORY: Resource Restoration  
INVESTIGATOR: Town of Plymouth Engineering Division  
LOCATION: South Coastal Watershed

**DESCRIPTION:**

The Town of Plymouth has undertaken a long-term strategy to improve water quality in Plymouth Harbor, which is impaired by pathogens. The Samoset Street outfall, which discharges to the harbor on the southern side of Town Wharf, drains approximately 118 acres of roadway and high-density residential and commercial property. The outfall is of great concern because of its proximity to 2,204 acres of closed shellfish beds.

The goal of this project is to improve the quality of surface water runoff entering Plymouth Harbor at the Samoset Street outfall. Bioretention facilities will be constructed at three priority sites to capture and treat surface runoff. Designs for the work were produced under a 2003 Coastal Pollution Remediation grant from the CZM program. The pollutant of concern is bacteria, although it is anticipated that other pollutants will also be removed by the BMPs. The project will be evaluated through development and implementation of a DEP- and EPA-approved QAPP.

Project tasks include:

1. Development and implementation of a Quality Assurance Project Plan;
2. Final designs, permits, and installation of three BMPs;
3. Development and implementation of an Operation and Maintenance Plan for the BMPs; and
4. Outreach and education about the project.

PROJECT COST: \$208,050

FUNDING: \$ 124,780 by the U.S. EPA  
\$ 83,270 by the Town of Plymouth

DURATION: 2005 - 2008

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**SECTION 319 NPS PROJECT 04-10/319**

PROJECT TITLE: Pontoosuc Lake Watershed Planning Program  
NPS CATEGORY: Watershed-Based Plan  
INVESTIGATOR: Berkshire Regional Planning Commission  
LOCATION: Housatonic Watershed

**DESCRIPTION:**

Pontoosuc Lake is a Category 5 water, impaired by metals and exotic aquatic vegetation. The presence of several species of non-native invasive aquatic plants also represents a threat to downstream waterbodies where the plants may spread. Physical and chemical analyses from a recent Diagnostic/feasibility study, ENSR 2000, indicate that there are several management techniques that can be employed to retard eutrophication and weed spread and improve water quality for recreational use.

This project is a combination of research, monitoring, planning, and education activities that builds upon previous studies and 319 projects (99-03/319, 01-14/319). The goal is to develop a Watershed-based Plan consistent with EPA requirements that will support the development and implementation of a TMDL and will lay the groundwork for development and implementation of effective remediation techniques. Project success will be measured through development and implementation of a DEP-and EPA-approved Quality Assurance Project Plan (QAPP).

Project tasks include:

1. Development and implementation of an approved Quality Assurance Project Plan;
2. Conduct water quality monitoring;
3. Conduct a Lake Watershed Survey and develop and Action Plan;
4. Conduct lake watershed cleanups; install lakefront vegetated buffers; and
5. Conduct a public education and outreach effort.

PROJECT COST: \$110,350

FUNDING: \$ 64,500 by the U.S. EPA  
\$ 45,850 by the Friends of Pontoosuc

DURATION: 2005 - 2008

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**SECTION 319 NPS PROJECT 04-11/319**

PROJECT TITLE: Cold Spring Brook Watershed Remediation  
NPS CATEGORY: Resource Restoration  
INVESTIGATOR: Town of Wellesley  
LOCATION: Charles Watershed

**DESCRIPTION:**

This project is intended to restore the structure, function, and water quality of Duck Pond, located on Cold Spring Brook near the Town Hall in Wellesley, MA. The Cold Spring Brook drainage area is comprised of 467 acres of highly developed land that includes Route 9 as well as other town-owned roads and parking areas. Duck Pond, located within this drainage, is highly influenced by stormwater runoff and pollution. In addition to high loads of sediment and associated pollutants, Duck Pond experiences elevated levels of fecal coliform bacteria due to a combination of the resident waterfowl population as well as nonpoint source of bacteria associated with stormwater runoff.

The goal of this project is to reduce sediment, nutrient, and fecal coliform loads to the Charles River via Cold Spring Brook and Fuller Brook through the implementation of structural and non-structural BMPs. Structural BMPs will include a flow distribution pipe for enhanced wetland treatment, and stormwater control devices in the upstream watershed. Project success will be measured through modeling of load reduction estimates brought about by BMP implementation, following a DEP-and EPA-approved Quality Assurance Project Plan (QAPP).

Project tasks include:

1. Development and implementation of an approved Quality Assurance Project Plan (QAPP);
2. Final designs, permits, and installation of BMPs;
3. Development and implementation of an Operation and Maintenance Plan for the BMPs; and
4. Outreach and education about the project.

PROJECT COST: \$197,800

FUNDING: \$ 118,700 by the U.S. EPA  
\$ 79,100 by the Town of Wellesley

DURATION: 2005 - 2008

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 04-12/319

PROJECT TITLE: Demonstration Boat Bottom Wash Water System  
NPS CATEGORY: Urban Runoff  
INVESTIGATOR: Manchester Marine  
LOCATION: Statewide/Coastal

#### DESCRIPTION:

Ordinary maintenance of boats includes power washing of boat bottoms to remove accumulated material that may contribute to degradation of the hull material and interfere with the boat's operation. Studies have shown that boat bottom washwater may contain pollutants including toxic metals, oil and grease, chlorine, ammonia, antifreeze, solvents, and other harmful material. The USEPA has promulgated regulations that require this washwater to be treated as industrial or process wastewater, but has offered few definitive means or recommended BMPs to assist boatyards to comply with the regulations. With the support of the Massachusetts Office of Coastal Zone Management, Manchester Marine will install a recycling boat bottom washing system. They will then conduct an extensive education and outreach program aimed at demonstrating this BMP to other boatyards, to make them aware of this BMP and encourage its adoption in other boatyards.

Currently, despite the regulations, boat bottom wash water is frequently allowed to run onto the ground. The goal of this project is to encourage the adoption of an effective BMP that will eliminate this significant source of NPS at boatyards. The project will be evaluated through development and implementation of a Quality Assurance Project Plan (QAPP).

#### Project tasks include:

1. Development and implementation of an approved Quality Assurance Project Plan;
2. Design and construction of a recycling boat bottom washing system;
3. An extensive outreach and education campaign to make other boatyards aware of this BMP and encourage its adoption elsewhere.

PROJECT COST: \$195,596

FUNDING: \$ 117,357 by the U.S. EPA  
\$ 78,238 by Manchester Marine

DURATION: 2005 - 2008

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 04-14/319

PROJECT TITLE: Development of Watershed-Based Plans  
NPS CATEGORY: n/a  
INVESTIGATOR: BETA Group, Inc.  
LOCATION: Statewide

#### DESCRIPTION:

The purpose of this project is to develop a Watershed-Based Plan for each of the 27 major Massachusetts basins. As outlined in the EPA's **Nonpoint Source Program and Grants Guidelines for States and Territories** (Oct. 23, 2003), EPA is requiring that a WBP be developed as a prerequisite for funding future 319 projects. Watershed-Based Plans developed under this project must contain the following elements:

1. Identification of causes and sources or groups of similar sources that will need to be controlled
2. Estimate of load reductions expected for the management measures described
3. Description of management measures that will need to be implemented to achieve the load reductions and identification of critical areas in which those measures will be needed.
4. Estimate of the amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that will be relied upon, to implement the plan.
5. Education/outreach used to enhance public understanding of the project and encourage their early and continued participation in selecting, designing, and implementing the NPS management measures that will be implemented.
6. A reasonably expeditious schedule for implementing the NPS management measures ID'ed in the plan.
7. Description of interim, measurable milestones for determining whether NPS management measures or other control actions are being implemented.
8. Criteria that can be used to determine whether loading reductions are being achieved over time and substantial progress is being made towards attaining WQ standards. And, if not, criteria for determining whether the plan or TMDL needs to be revised.
9. Monitoring component to evaluate the effectiveness of the implementation efforts over time, measured against the criteria in item 8. above.

Wherever possible, the Watershed-Based Plan will incorporate existing information from other documents, e.g. various state and local watershed planning documents or watershed plans. The resulting Watershed-Based Plan must be designed to achieve the load reductions called for in a NPS TMDL, and, in doing so, should be designed to meet water quality standards.

#### Project tasks include:

1. Development and implementation of a Quality Assurance Project Plan (QAPP);
2. Identification and compilation of existing documents and data that will be used to satisfy the required elements;
3. Identification of data gaps and modeled estimates to address them;
4. Development and implementation of a workplan to address any elements that have not already been addressed in previous studies; and
5. Synthesis of new and existing information into an individual WBP for each of 27 major basins.

PROJECT COST: \$970,283

FUNDING: \$ 582,170 by the U.S. EPA  
\$ 388,113 by the Commonwealth of Massachusetts

DURATION: 2005 – 2007

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**SECTION 319 NPS PROJECT 04-15/319**

PROJECT TITLE: Dudley Pond Comprehensive Water Quality Improvement Project  
NPS CATEGORY: Resource Restoration  
INVESTIGATOR: Town of Wayland  
LOCATION: SuAsCo Watershed

**DESCRIPTION:**

Dudley Pond is an 84-acre great pond in the Concord River watershed. The Pond is Category 5 listed for turbidity and exotic species. In addition to turbidity from nonpoint watershed sources, nuisance growth of Eurasian milfoil is a serious problem for the Pond that significantly impairs its ecological and recreational value. This project is part of a long-term strategy to mitigate water quality impairment in Dudley Pond using both in-lake and watershed BMPs.

This project will reduce sediment and nutrient loads to Dudley Pond by implementing low impact development BMPs and restoring a section of eroding riverbank. To help control aquatic vegetation, milfoil weevils will be introduced and diver hand-pulling will be conducted in targeted areas. Targeted pollutants include sediment, nutrients, and Eurasian milfoil. Project success will be measured through development and implementation of a DEP-and EPA-approved Quality Assurance Project Plan (QAPP).

Project tasks include:

1. Development and implementation of an approved Quality Assurance Project Plan;
2. Construction of a bioretention cell;
3. Outlet protection/bank restoration;
4. Introduction of milfoil weevils;
5. Milfoil hand pulling;
6. Catch basin stenciling; and
7. Public outreach and education.

PROJECT COST: \$ 70,458

FUNDING: \$ 42,150 by the U.S. EPA  
\$ 9,200 by the Town of Wayland  
\$ 19,108 by the Dudley Pond Association

DURATION: 2005 - 2008

## MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### SECTION 319 NPS PROJECT 05-01/319

PROJECT TITLE: Operation and Maintenance of the Massachusetts Alternative Septic System Test Center  
NPS CATEGORY: Land Disposal  
INVESTIGATOR: Barnstable County Dept. of Health and the Environment  
LOCATION: Statewide

#### DESCRIPTION:

The Massachusetts Estuaries Program (Project 01-26/319) is in the final phase of developing Total Maximum Daily Load (TMDL) allocations for nitrogen in some marine estuaries in Barnstable County. As implementation strategies begin to be developed in Barnstable County and elsewhere, the question remains as to whether innovative/alternative septic systems can provide an enhanced level of treatment that will help provide the necessary pollutant load reductions to meet TMDL goals.

The Massachusetts Septic System Test Center serves as a resource for quality third-party performance information regarding advanced onsite septic system technologies. In addition, the existence of the Test Center promotes the trial of new technologies to reduce nitrogen and phosphorus from wastewater. This continuing project endeavors to support the state's TMDL program by providing environmental decision makers with the tools by which the goals of the TMDL program can be achieved, especially where wastewater is a major source of pollutant loading. The project proposes to continue the ongoing work of the MASSTC. The project will be evaluated through development and implementation of a DEP- and EPA-approved Quality Assurance Project Plan (QAPP).

Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Conducting facility operations,
3. Synthesizing data derived from testing new systems,
4. Reporting on test results, and
5. Outreach and education through published articles and facility tours.

PROJECT COST: \$ 265,805

FUNDING: \$ 116,555 by the U.S. EPA  
\$ 149,250 by various onsite system vendors

DURATION: 2005 - 2008

# MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

## SECTION 319 NPS PROJECT 05-03/319

PROJECT TITLE: Windsor Reservoir Restoration Project  
NPS CATEGORY: Resource Restoration  
INVESTIGATOR: Dalton Fire District  
LOCATION: Housatonic Watershed

### DESCRIPTION:

Windsor Reservoir is an approximately 62-acre drinking water reservoir located in the towns of Hinsdale and Windsor. It serves as the primary drinking water source for the town of Dalton. The Dalton Fire District is charged with providing drinking water to Dalton from this reservoir and two other surface water sources as well as one groundwater source. In August 2003, severe storms dumped 10" of rainfall on the area in a one-hour period. The resulting local flooding and erosion of the gravel roadways adjacent to the Windsor Reservoir caused an immediate shutdown of the water supply due to excess turbidity. The instability of the roadway and excessive deposits of sediment have caused problems ever since. The watershed towns of Hinsdale and Windsor have been reluctant to allocate scarce local resources to address roadway problems in an area that is not a priority part of their own infrastructure.

The goal of this project is to repair and stabilize the roadways, install flood protection and stormwater BMPs, and remove accumulated sediment from the inlet tributary. This work is recommended in a SWAP report for the water supply. Pollutants of concern are sediment, turbidity, and phosphorus. The project will be evaluated through development and implementation of a DEP- and EPA-approved QAPP.

### Project tasks include:

1. Development and implementation of a Quality Assurance Project Plan (QAPP);
2. Final designs, permits, and installation of BMPs;
3. Development and implementation of an Operation and Maintenance Plan for the BMPs; and
4. Outreach and education about the project.

PROJECT COST: \$150,000

FUNDING: \$ 90,000 by the U.S. EPA  
\$ 60,000 by the Dalton Fire District

DURATION: 2005 - 2008



**APPENDIX**  
**319 NONPOINT SOURCE PROGRAM PROJECTS 1990-2000**

- 90-01/319 Avon Industrial Park Storm Water Management**  
by Old Colony Planning Council
- 90-02/319 Milkroom Wastewater Treatment Demonstration**  
by Northwest Worcester Co. Conservation Dist.
- 90-03/319 Pesticide Handling Demonstration**  
by Franklin, Hampden & Hampshire Co. Conservation Districts
- 90-04/319 Development of Pesticide Data and Support System for Risk Assessment**  
by Worcester County Conservation District
- 90-05/319 North and South Rivers Storm Water Mitigation**  
by North & South Rivers Watershed Assoc.
  
- 91-01/319 Soil Morphology as an Indicator for Maximum Groundwater Elevation Levels in MA**  
by UMass, Amherst, Department of Plan and Soil Sciences
- 91-02/319 Rehabilitation and Evaluation of the Sterling Filter Beds at Wachusett Reservoir**  
by MDC, Division of Watershed Management
- 91-03/319 Soil Bioengineering Streambank Protection Measures on the Blackstone and North Rivers**  
by Franklin, Hampden & Hampshire Co. Conservation Districts
- 91-04/319 Investigation of Low-Input Cranberry Production**  
by UMass, Amherst, Entomology Dept.
- 91-05/319 Hydrogeologic Evaluation of the Waquoit Bay Land Margin Ecosystem**  
by Cape Cod Commission
  
- 92-01/319 Spragues Cove Storm Water Remediation**  
by Town of Marion
- 92-02/319 Control of Urban Runoff in the Connecticut, Merrimack and Sudbury River Basins**  
by Metropolitan Area Planning Council
- 92-03/319 Ipswich River Nonpoint Source Prevention Program**  
by MDFWELE, Riverways
- 92-04/319 Technical Support for Developing and Implementing Urban Runoff Nonpoint Source Control Strategies in the Merrimack River Basin** by DEP, Division of Water Supply
  
- 93-01/319 Storm Water Remediation for the Broad Marsh River**  
by Town of Wareham
- 93-02/319 Sediment and Erosion Control in the Taunton River Basin Program**  
by MDFWELE, Riverways
- 93-03/319 Artificial Recharge Evaluation and Guidance to Municipalities**  
by Pioneer Valley Planning Commission
- 93-04/319 H<sub>2</sub>Ome Check Pilot Project**  
by Nashua River Watershed Association
- 93-05/319 Commercial Underground Storage Tank Compliance** by Barnstable County Department of Health and the Environment
- 93-10/319 Cape Cod Coastal Nonpoint Source Management Plan**  
by Cape Cod Commission
- 93-11/319 Wachusett Septic System Management System**  
by UMass Cooperative Extension, Amherst
- 93-12/319 Nitrogen Loading Model Computer Program Development**  
by Horsley & Witten, Inc.
- 93-13/319 Development and Outreach of an Erosion and Sedimentation Control Guide for Massachusetts**  
by Franklin, Hampden & Hampshire County Conservation Districts

- 94-01/319 Best Management Practices to Control Nonpoint Source Pollution from Forestry Operations**  
by Berkshire-Pioneer Resource Conservation and Development Area
- 94-03/319 Green River Soil Bioengineering Demonstration Project**  
by Berkshire Conservation District
- 94-05/319 Alternative on-Site Septic Systems – Encouraging Their Use in Environmentally Sensitive Areas of Barnstable County**  
by Barnstable County Dept. of Health and the Environment
- 94-06/319 Orleans Storm Water Remediation Project**  
by Cape Cod Conservation District
- 94-07/319 Mill River Nonpoint Source Management Project**  
by Mass Audubon Society, North Shore
- 94-08/319 Lake Tashmoo Storm Water Remediation Project**  
by Tisbury Waterways, Inc.
- 94-09/319 Jones River/Billington Sea Nonpoint Source Pollution Control Project**  
by Pilgrim Resource Conservation & Development Area Council, Inc.
- 95-01/319 Lake Lorraine and Fivemile Pond Nonpoint Source Project**  
by Pioneer Valley Planning Commission
- 95-02/319 A Demonstration Program to Mitigate Storm Drain Pollution Impacting Shellfish Beds**  
by MA Coastal Zone Management
- 95-03/319 Buttermilk Bay Storm Water Remediation Project**  
by Town of Bourne
- 95-04/319 Demonstration of Urban Pollution Control in the Green River Watershed**  
by Franklin, Hampden and Hampshire Conservation District
- 95-05/319 Demonstration of an Alternative On-site Wastewater Disposal System at Allen’s Pond Wildlife Sanctuary** by Buzzards Bay Project
- 95-06/319 Comprehensive Nonpoint Source Management in the Mill River Subwatershed, Hatfield, MA**  
by Pioneer Valley Planning Commission
- 95-07/319 Title 5 Training for Boards of Health in Five Towns in Barnstable County**  
by Barnstable County Department of Health and the Environment
- 95-08/319 Swan Pond River Storm Water Remediation Project**  
by Town of Dennis
- 95-09/319 Buzzards Bay Action Committee-Holmes Brook Restoration**  
by Buzzards Bay Action Committee
- 95-10/319 Developing and Conducting Training Workshops for the Revised Regulations for MGL C 132, Forest Cutting Practices Act** by Berkshire-Pioneer Resource Conservation and Dev. Area Council
- 95-11/319 Neponset River Fishway Project**  
by MA DEP
- 96-01/319 Septic System Management 2000 Project**  
by Cooperative Extension System, UMass, Amherst
- 96-02/319 Monitoring Strategies for Innovative On-site Sewage Disposal Technologies**  
by UMass, Amherst and Lowell
- 96-03/319 Connecticut River Watershed Restoration Project**  
by Franklin County Commission
- 96-04/319 Demonstration of Urban Streambed Stabilization and Wetlands Function and Wildlife Habitat Improvement Using Soil Bioengineering Treatments at Hearthstone Quarry Brook, Chicopee**  
by City of Chicopee
- 96-05/319 Spicket River Watershed Revitalization**  
by Merrimack River Watershed Council
- 96-08/319 Statewide Outreach Course and Tool Kit and Central Massachusetts Partnership Pilot**  
by Worcester County Conservation Districts
- 96-09/319 Sub-Basin Assistance for the SuAsCo and Charles River Watersheds**

- DFWELE, Riverways Program
- 96-10/319 Watershed Display on NPS Information, Basin Team Newsletter and Resident Survey**  
by Berkshire Conservation District
- 96-11/319 Watershed Education Teaching (WET) Program**  
by UMass Cooperative Extension System, Amherst
- 97-01/319 Development of Stormwater Utilities in Two Demonstration Communities: Chicopee & South Hadley**  
by Pioneer Valley Planning Commission
- 97-02/319 Red Lily Pond Rejuvenation**  
by Town of Barnstable
- 97-03/319 Technical Outreach to Communities Regarding Alternative On-Site Septic Systems**  
by Barnstable County Dept. of Health and the Environment
- 97-04/319 Alternative Septic Systems Technologies Workshop Program**  
by Berkshire Regional Planning Commission
- 97-05/319 Leak Prevention for Heating Oil Storage Systems**  
by Barnstable County Dept. of Health and the Environment
- 97-07/319 Protecting Nitrogen Sensitive Coastal Embayments Through Land Conservation**  
by Buzzards Bay Project
- 97-08/319 Hall's Pond Wetlands Restoration Project**  
by Town of Brookline
- 97-09/319 Three Bay Area - Ropes Beach Subwatershed**  
by Town of Barnstable
- 98-01/319 Determining the Effectiveness of On-Site Septic Systems for the Removal of Viruses**  
by Barnstable County Dept. of Health and the Environment
- 98-03/319 Coastal Embayment/Title 5 Training Video**  
by Cape Cod Commission
- 98-05/319 Nashawannuck Pond Watershed Restoration Project, Easthampton, MA**  
by Pioneer Valley Planning Commission
- 98-06/319 NPS Pollution Correction in the Farmington River Watershed – Dirt Roads BMP Handbook**  
by Berkshire Regional Planning Commission
- 98-08/319 Protection of First Herring Brook**  
by Town of Scituate
- 98-09/319 Manual of Innovative/Alternative On-Site Wastewater Treatment Technologies**  
by UMass Amherst
- 98-11/319 Development and Demonstration of Protocols for Evaluating Greywater Disposal Systems**  
by Massachusetts Department of Environmental Protection
- 98-12/319 Demonstrating the Use of Eelgrass Monitoring to Assess Coastal Nonpoint Source Pollution**  
by Massachusetts Department of Environmental Protection
- 98-07/319 Reducing Stormwater in an Ultra-Urban Watershed**  
by City of Somerville
- 99-01/319 Alternative Septic System Test Center Project Monitoring**  
by Buzzards Bay Project
- 99-03/319 Pontoosuc Lake Watershed Resource Restoration Project**  
by Berkshire Regional Planning Commission
- 99-04/319 Winsegansett Salt Marsh Restoration Project**  
by Town of Fairhaven
- 99-05/319 Telecom City: Malden, Medford, Everett**  
by Mystic Valley Development Commission
- 99-06/319 Development of Recharging Stormwater Control Structures and Flow and Volume Design Criteria**  
by UMass/Amherst
- 99-07/319 Design and Guidance for Shallow Trench Low Pressure Pipe Distribution Systems for the Massachusetts Title 5 Innovative/Alternative Septic System Program**

- by UMass/Amherst
- 99-08/319 Mill River Watershed Restoration Project**  
by Franklin Regional Council of Governments
- 99-09/319 Demonstration of Best Management Practices to Control Agricultural NPS Pollution**  
by Massachusetts Department of Food and Agriculture
- 99-11/319 Coastal Zone Management Stormwater BMP Monitoring Project**  
by Massachusetts Department of Environmental Protection and Office of Coastal Zone Management
- 00-01/319 Implementing the Diagnostic/Feasibility Study Recommendations for Onota Lake**  
by the Berkshire Regional Planning Commission
- 00-02/319 Alternative Septic System Test Center Project Monitoring**  
by the Barnstable County Department of Health and the Environment
- 00-03/319 Development of a Rapid Field Test for the Quality of Stone Aggregate in Onsite Septic Systems**  
by the Barnstable County Department of Health and the Environment
- 00-04/319 Connecticut River Watershed Restoration Phase II**  
by the Franklin Regional Council of Governments
- 00-05/319 Atlas of Stormwater Discharges**  
by the CZM Buzzards Bay Project
- 00-06/319 Management Strategies for MA Dairy Farms to Reduce the Risk of Nonpoint Source Pollution**  
by UMass Amherst
- 00-07/319 Town of Acton Nonpoint Source Control Program**  
by the Town of Acton
- 00-08/319 Long Pond Restoration Project**  
by the Town of Littleton
- 00-09/319 Onset Bay, Wareham, MA, Nonpoint Source Pollution Remediation Project**  
by the Town of Wareham
- 00-10/319 Shaw's Plaza Drainage NPS Management**  
by the Town of Sharon